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ART. XIX.—ADDRESS TO THE GRADUATES OF THE PHILADELPHIA COLLEGE OF PHARMACY.

Delivered April 15th, 1846.

By Joseph Carson, M. D., Professor of Materia Medica and Pharmacy.

Gentlemen,—We are convened on the present occasion that you may receive publicly, at the hands of the officers of this institution, the testimonials of qualification to engage in the exercise of your profession, and by this act, to sever the bond by which hitherto you have been united to them. From their control and authority you are now to be dismissed, and it becomes obligatory upon them, in receiving you as equals and associates, to impress upon you a proper comprehension of the obligations you assume. Permit me, therefore, as the organ of my colleagues, to engage your attention for a brief period, with the effort to set before you the principles of action that should regulate your future conduct.

It need hardly be urged, at this time, that the career, upon which you have entered, is one of the highest responsibility; for in addition to that which must unavoidably devolve upon you as citizens, as members of a civilized, refined, and Christian community, there is another which is of your own assumption, and which you can neither evade nor

shrink from—the responsibility of a profession, liberal in its pursuits, and intimately associated with the welfare and happiness of fellow beings. To prosecute successfully the duties of this profession, must be the ardent aspiration of each ingenuous mind, as in it are involved reputation, station in society, competency and influence—the most desirable acquisitions which man can covet, and from which eminently originates the power of usefulness.

In aiming at success, however, correct and definite ideas should be entertained of its nature, and the means of its accomplishment; for to enter upon the voyage of life without them, would be as senseless as the expedition of the mariner to distant lands, without a thought of where they lie, and destitute of the ordinary helps of navigation. The rocks and whirlpools that are placed in the track of every man's existence, are numerous and deceptive; and ere he may be aware of their proximity, the bark, so richly freighted with his resources, may come upon them, the victim of his heedlessness and folly. To the honourable and exalted spirit, all success is not desirable. Where genuine and legitimate merit can be found, *there* must exist also the spurious and counterfeit. Success, the offspring of unsettled principles, unsteady purposes and springs of action, must necessarily be ephemeral and evanescent, because entirely destitute of sustaining basis. The materials that constitute it are valueless and fictitious. It may pass for true, as gloss and polish may be given to its surface, but is destined to reveal its real essence, by soon becoming dull and tarnished. That alone which originates from a determinate plan of operation, in which the objects of attainment have been properly appreciated, where motives both laudable and substantial constitute the ground work, can prove durable and satisfactory.

It is moreover an undeviating law of nature, trace it where you may, that formations of rapid growth are proportionably unstable, while those that are tardy in the at-

tainment of their full dimensions, and acquire but slowly their strength and vigour, are firm and unyielding. The same rule is applicable to the results of human enterprise, in which category may be ranked professional success.

The first and most important requisite of success, is adequate preparation to perform the duties appertaining to the pursuit that may have been selected. This would seem to be a self apparent truth ; but by no means are its full force and cogency appreciated. Indeed, if there be an evil prevalent in our own day and generation, it is the assumption of duties and responsibilities, for which there is no fitness from previous training—physical, moral, or intellectual. The presumptuous mind of man is undismayed by ignorance and incapacity, and urges to the arrogation of trust and confidence on the part of the community, to which there can be given not even the shadow of a title. In the mechanical arts, and those that can be comprehended by the majority of mankind, such arrogance can be detected, and invariably brings upon the individual who ventures upon its adoption, contempt and ridicule. But beyond the pale of the class alluded to, there exist numerous occupations of which the public have not the means of rightly judging, of which no correct or adequate opinion can be formed ; and in which, for a time at least, faith is accorded to bold pretensions and unhesitating promises. *Charlatanry*, gaunt, lean, hideous charlatanry, stalks untrammelled throughout the land, assuming forms and hues forever varying, in accordance with the depraved and vitiated taste for novelties; and like an evil spirit seeking a resting place, but finding none, invades the precincts of many an honourable and necessary calling. Wealth may be accumulated by it, but all the gold of Ophir could not disguise the degradation of its nature. I may then insist upon it as a proposition neither to be overthrown nor controverted, that nothing but a thorough knowledge of the pursuit, which is to constitute the business of life, can give the skill that is adequate for its successful prosecution.

The occupation which you, Gentlemen, have chosen, is Pharmacy. It is no ordinary one. It deals not with the gross materials of which this earth is fashioned, but is occupied with the rarest and most subtle products derivable from the vast storehouse of Nature. It employs them not to please the senses, to enhance the zest for external indulgence, to cast around existence a halo of pleasureable perceptions, and to gratify those tastes which elevate the human character; but applies them to meliorate the ills that are inseparable from our frail and perishable organization. It serves not man in vigour, hope and high enjoyment, but comes to him when prostrate and helpless, and, like an angel of mercy, bids him not despair. It is devoted to soothing the anguish of the body, and quiets the fears and apprehensions of the mind. Surely it is no ordinary occupation.

Nor is it one of easy acquisition. Extensive information is required to qualify the candidate for public confidence. A vast array of facts must be crowded on the memory, through which the eye of science must penetrate, to adjust and understand them. The perceptive faculties must be sharpened, the mind aroused in the observation of phenomena, the judgment cool and nice in its discrimination. The substances, with which the pharmaceutist must unavoidably manipulate, are full of good, or capable of irreparable injury. He may be the instrument of restoring to health the sufferer, and bestowing happiness upon himself and family, by faithfully and dexterously performing the task assigned him; or he may ruin both, by the committal of an error. To master all the details of the pharmaceutic art, to become an adept, efficient, safe, and trustworthy, requires a long apprenticeship, a profound and systematic course of study, and instruction in several branches of natural and physical science. Surely then it is not an easy occupation.

Your novitiate has been well accomplished; you have

taken advantage of all the facilities presented to you, for adequately preparing yourselves to fill your high office. You now go forth, trusting solely to the character you have earned, and are about to engage in a struggle for preferment—a struggle which will call forth all the abilities of which you are possessed, and which will be arduous and protracted. Your training for the effort has ceased; your starting point is from this place, and from this moment. With so auspicious an entrance upon the course before you, much will be expected from you, and undoubtedly much will be accomplished by you.

A second requisite of success, consists in the adaptation of the talents that may be possessed, and knowledge that has been acquired, to the circumstances by which the individual is surrounded. No reasoning is necessary to be convinced, that the affairs of this world are not stationary. Demonstration is given on every side, that its whole surface is mobile. Time moves on, and carries with it the mass; not directing it into one channel, but breaking up and separating it into a multitude of currents. Progression is inseparable from our condition, a wise provision of our Maker, by which in his scheme of direction and government, the state of mankind is improved and elevated; and stagnation of all noble qualities prevented. The world as it was originally, and as it now is, presents aspects so diversified and so discrepant, that it would be impossible to understand the connexion, were we not familiar with this all powerful, eternally operative law of creation. It applies to every thing, and the idea of quiescence is not only unphilosophical, but unnatural.

With this mutability in the events of life, the mind of man is wonderfully in unison; active, restless, and unsettled, it perpetually seeks to expend its energy in new and unexplored directions. To be passive is to retrograde.

Among the older nations of the earth, the changes that are entailed are not as perceptible as they might be, because

so gradual in their production; as in heavy bodies, the *vis inertiæ* is greater which controls them; yet by comparison they become apparent, and revolutions in public feeling, in government, in the arts, in science, and in literature, are steady and unceasing. In a land like that in which we dwell, among a people constituted as our own, fixedness of thought and action is not to be expected, transition is every where in operation. Augmentation in power, in resources, in intelligence, in influence is rapidly progressing; and full maturity cannot be attained, until the elements that serve to nourish enterprise, have been all developed. To the young and enthusiastic, positive as are the advantages of such a state, yet numerous are the difficulties and dangers. Eagerness for advancement, miscalculation of measures for its attainment, imprudence in the adoption of such as are uncertain, and improvidence in the expenditure of means which should have been most carefully husbanded, have been the causes of many a failure. Moderation, caution, self-control, and forethought, are qualities absolutely essential. I wish not to be misinterpreted, however. I am the advocate of no timid policy, no wavering line of conduct; a decided course alone can be successful. I only wish earnestly to enjoin discretion, and point to it as a polar star, steadily to be kept in view amidst the favourable winds and currents of circumstance, by whose aid the destiny of every human being is determined.

To you, an extensive field of enterprise is opened. A wide-spread country, a growing population, industry, frugality, and information diffused in every quarter, are especially fitted to abet your exertions. You cannot remain in supineness and inaction, and claim the apology of want of opportunity. All around you is in a state of activity; and lost to a sense of propriety or shame must he be, who becomes imbued with no kindred impulses; and still more imbecile and worthless he, who cannot appropriate to himself some passing chances to advance his fortunes. Your pro-

fession is a thriving one; its future prospects are most encouraging; it has within itself resources to gratify any reasonable ambition; and you may either reap the harvest which is sure to follow right endeavours, or leave it to be secured by others, whose courage, energy, and perseverance entitle them to gather it.

Another requisite for success, depends upon a sedulous and irrepressible devotion to the objects which seriously occupy the attention. Happily enthusiasm has been extensively implanted in the soul, and few are so formed as to be without it. When restricted to its peculiar limits, it enhances much the pleasure, and adds greatly to efficiency in the performance of respective duties; in fact, without it, even mediocrity can hardly be attained. But I may advance one step farther, and assert, that from this principle originates all improvement. Without it, inquiry would languish; and ingenuity, unexcited to legitimate exercise, would be expended upon trifles. Nothing great, nothing good, has been accomplished without the infusion of an enthusiatic feeling, which has led to the removal of difficulties nearly insuperable, and brought forth discoveries the most remarkable. Genius must be aroused by it, or genius must lie dormant and profitless. In every department of knowledge, it has been the impulsive instrument of extension; for the love of knowledge and discovery alone, would prove of little service.

Enthusiasm bestowed spirit and animation upon the researches of Newton, cold and abstract as they may appear to an ordinary observer. It kept the metaphysical mind of Locke upon the stretch to fathom the depths, and unfold the operations of the human intellect. It stimulated Cuvier in the exploration of the external forms and modifications presented on the surface of the globe, and aided him in building up a system of arrangement before unequalled. It so completely possessed the control of Davy, as to render him untiring in his labours. And it sustained Champolion

amidst the burning sands of deserted Egypt, and enabled him to proclaim the true signification of the hieroglyphical records. These are but a few bright and illustrious examples. In every branch of science, moral, speculative and natural, many, almost innumerable, others might be instanced.

But I must not wander beyond the domain of our own peculiar department, as it affords us ample room for illustration. What applies to the exercise of the more exalted gifts of understanding, and the most striking objects of investigation, applies equally to less eminent endowments, and to subjects that are less notable. The history of Pharmacy, from the period at which the Alexandrian school existed, when it was erected into a distinct branch of medical science, to the present time, is teeming with the evidence by which our declarations may be sustained. I need not detail the stages of its advancement, or indicate the steps in the course of progress that have contributed to place it on its present footing; the bare mention of the names of Gaubius, of Glauber, of Silvius, and Lemery, of Gay Lussac, and Vauquelin; and in our own day of Derosne, of Pelletier, and Caventou, of Guibourt, and Virey, and many, very many others, will bring at once into the memory the vast array of services they have rendered to it.

Yet this ardour in the cause of pharmacy has not been confined to our transatlantic brethren. Their spirit has been shed abroad, and we have been benefitted by its diffusion. Trace the progress of the science in our own country, and it will be found that the same efficient principles have been in operation. Look at the improvements that have been introduced on every side, at the efforts that have been made to extend and increase information, to elevate the standard of proficiency, to present the means of education, and preparation for its practical duties; and conviction must follow that carelessness and indifference to our own well being have not restricted our endeavours. And who

have been the efficient agents in this good work, this, to them, labour of devotion and of love? Enlightened, public spirited men, who were not willing to be behind the age, in what might profit their generation and those to follow them. I cannot praise the living, but it may be permitted me to give a passing tribute of acknowledgment to the departed. Our Association, this College, whom, within our own recollections, has it lost worthy of being held up for imitation? one, young in years, but old in services; for us too early called away, and yet not leaving us without the deeply fixed impression on our minds, that he was our benefactor. In alluding to the late *Professor Fisher*, I am aware a train of melancholy reminiscences is awakened, a chord of feeling is touched which vibrates sympathetically in the bosom of all who knew him. Around me are his friends and his associates, and they have deeply felt and well appreciate his worth; for to the heart of every one with whom he came in contact, his quiet, gentle and conciliating deportment found its way, and lasting attachment was the consequence. For evidences of his zeal, his energy, his untiring interest in the cause of his profession, I refer you to the pages of our own and other journals, where his contributions may be found, the monuments of his labours. He was taken from his place among us, and left a void in our affections, but his name will still be cherished, and may its hallowing influence hover round us, and prompt to deeds of emulation. Like the green blades and flowers which each spring arise from his premature grave, to show that all is not cold and lifeless where he lies, may our annual efforts for the promotion of our science testify conclusively that his precepts and his example have not been lost upon us.

But I am again impelled to call up commingled recollections of pain and pleasure, inseparably connected with this School of Pharmacy. An individual, once a member of our body, prominent with others, was among the first in his endeavours to promote its successful establishment. In

this country it was a new and untried undertaking, but the success with which it has been crowned, has long since clearly exhibited the advantages expected by its founders. A foresight of the future, an anticipation of the growing wants of the profession, the necessity of preparation to meet the demands of the community, originated the enterprise. But it required unceasing vigilance, inexhaustible perseverance, wide spread influence and unwearied personal attention. For all these our lamented *Vice President Troth* was distinguished; he boldly took his stand in favour of improvement, and no difficulties drove him from his path, no disappointment diminished the firmness of his determination to accomplish it. His hope was high, and he had the faculty of infusing it into all within his circle. His manly bearing, his practical intelligence, his tones of encouragement, and decided liberality, communicated power, and it was wielded for the advancement of this his favorite project. In speaking of him thus, I detract nothing from the merit of those who stood by him, and aided him. I praise him because he is no longer with us; and bring his deeds before our minds, because it is a melancholy enjoyment to dwell upon his memory, more especially in connexion with the present ceremonies, in which so often he stood conspicuous. His mantle is among us, and will continue to cover, I trust, many an eminent successor. I have selected these examples, because I have been intimately associated with them. They might well be multiplied, but my observations must be restricted, and my design of exhibiting worthy characters for emulation has been accomplished.

Gentlemen, the remarks that have just been made with reference to the leading master spirits of your profession, are applicable to yourselves. Your zeal and devotion to it are not to be confined within the narrow limits of your own advantage, to the every day details which have no other end than the promotion of self gain. Sedulous must you be in all particulars; attentive to the interests of those who repose confidingly upon you, ever ready in the discharge of

demands which are imperative; but in addition, a debt of gratitude weighs upon you, an obligation to return in kind the benefits you have received from the labours of your predecessors and cotemporaries. I mean, that you should exert yourselves, so far as talent has been conferred, to still continue the improvement of your profession. I will not occupy your time by specifying the mode by which this can beaccomplished. The means are known to you, or will in the course of your experience become familiar, but simply wish to impress the fact upon you, that at the present period an extensive field of research and observation is presented in the projected revision of our *National Standard;* a labour in which all, who can do so, should engage, and thus exhibit by what close ties of fellowship we are united.

The last requisite on which I shall insist is strict integrity. In every code of morals, the teaching is the same with reference to this point, and the advantages of honesty are exhibited as incentives to its practice. Whether from pagan or Christian writers, the language used cannot be misinterpreted. The declaration of the Latin moralist and orator is "Itaque utilitas valuit propter honestatem, sine qua ne utilitas quidem esse potuisset;" and the great expounder of the system, by which our conduct is professedly regulated, tells us most explicitly "to provide things honest in the sight of all men," and to "be in all things willing to live honestly." It would be but an insult to your moral principle, to intemperately urge upon you conformity to such golden precepts; but in discharging the task assigned me, I cannot do otherwise than regard you as subject to the infirmities that appertain to human nature; and if a deviation from the highest standard did not happen, such precepts might be regarded as superfluous. Temptation must occur to every one, and happy he who can resist it. To every mode by which a livelihood is made, the charge of deviation from the path of rectitude is applicable, and, unfortunately, with respect to pharmacy, is too well founded.

The facilities for imposition are innumerable, and in the hands of a designing and unprincipled individual may readily be turned to profit. To be guilty of the practices, over which the upright disciple of pharmacy must mourn, is, to say the least of it, an utter recklessness of character and sacrifice of honour; but to take from the sick and dying the prop on which his hope for restoration and life depends, is inexcusable—nay, a heinous crime; and I envy not the man who bears it on his conscience. No competition can warrant it; for where "poverty but not the will consents" to acts so flagrant, better abandon the profession and seek an honest living in some other; for as the sentiment is not too strongly expressed, that "an honest man is the noblest work of God," no one, whose head and heart are right, can deliberately suffer himself to be undeserving the eulogy.

Gentlemen, I have now concluded the remarks which I proposed to make at the commencement of this address, and I commit them to your serious consideration. The standard of success which has been held before you is high, but I am certain, that were it less so, it would not satisfy your wishes. What has been said in urging you to strive for its attainment, is not all that might have been appropriately said. The ethics by which pharmacy should be regulated are wide spread and minute, extending themselves into an infinitude of ramifications. To embrace the whole in a single discourse would be impossible. I submit the subject to your reflection, confident of the result; and feeling that all our labour and anxiety will not be lost upon you. May prosperity and happiness bestow their smiles upon you; and if adversity should come, may its iron grasp be mitigated by the consciousness of rectitude. Approve yourselves like men, and you cannot fail to be ornaments of the community in which your destiny is cast, and sustain the credit of the College by which you have been adopted. Farewell.

ART. XX.—ANALYSIS OF A CONCRETION FROM A HORSE'S STOMACH.

By CHARLES M. WETHERILL and M. H. BOYÉ, M. D.

(*From the Proceedings of the American Phil. Society, March*, 1846.)

THIS concretion, for a fuller description of which in connection with its history Dr. B. referred to his friend, Dr. B. H. Coates, by whom it was handed to him for examination, is remarkable for its size, weighing 11¼ lbs.

It is of an oval shape, smooth surface, brownish-grey colour, and breaks in concentric layers of different thicknesses, exhibiting a fibrous or radiated structure. The outer layer alone was analysed. The concretion was found by Dr. Coates to contain a nail in its centre.

By a qualitative examination it was found to consist of phosphoric acid, magnesia, ammonia, chemically combined water, a small portion of organic matter and silex. It contained no lime. In order to determine quantitatively these ingredients, a portion was dissolved in dilute chlorohydric acid—the insoluble residue collected on a counterpoised filter, dried, and weighed; after incineration and weighing, it yielded *insoluble inorganic matter* 0.45 per cent, which, deducted from its former weight, gave *insoluble organic matter* 0.64 per cent. To the filtered solution, was added a weighed portion of iron wire, dissolved in nitro-muriatic acid, and the whole then precipitated by ammonia. Having previously ascertained the amount of peroxide of iron, yielded by an equal portion of the same iron wire, the difference in weight of these two precipitates gave for the *Phosphoric acid* 32.40 *per cent.*

To the filtered solution from the phosphoric acid, was added caustic potash in excess, and the whole boiled until the ammoniacal vapours were effectually expelled, and the

solution gave a strong alkaline reaction. The magnesia thus obtained was collected upon a filter, washed with boiling water, incinerated and weighed; it yielded 14.45 per cent.

Another portion of the powdered concretion, dried over sulphuric acid in vacuo at ordinary temperature, yielded *hygrometric moisture* 1 per cent; incinerated, it yielded *volatile matter (water and ammonia)* 51.70 *per cent.*

In order to determine the amount of ammonia, another portion of the powder was introduced into a small tubulated retort with carbonate of soda and water. The neck of the retort was adapted to a small tubulated receiver, containing dilute hydrochloric acid, and having adapted to its tubulure a nitrogen bulb, such as is used in ultimate organic analysis; this also contained dilute hydrochloric acid. The mixture in the retort was then evaporated to dryness, and at the close of the operation, air was drawn through the apparatus to insure the absorption of the last portion of ammonia.

The ammonia thus obtained was estimated by precipitation by chloride of platinum as in organic analysis, and yielded 0.71 per cent.

Hence the composition of the concretion is as follows :—

Phosphoric acid, - -	32.40	per cent.
Magnesia, - - - -	14.45	"
Water, - - - - -	50.35	"
Ammonia, - - - -	.71	"
Insol. inorganic matter,	.45	"
" organic "	.64	"
Hygroscopic moisture,	1.00	"
	100.00	

It will be seen from this, that the amount of ammonia is too small to be considered an essential ingredient of the concretion. Assuming it to exist in the state of double phosphate of ammonia and magnesia with water (NH^4O,

2 Mg O, PO_3+2 HO+10 HO,) and deducting the amount of this salt from the rest, (omitting the insoluble matter and hygroscopic moisture), it will be seen that the concretion is composed mainly of the phosphate of magnesia and water, according to the following formula, 3 MgO+3 HO+ 2 PO^5+21 Aq. as will be seen from the following composition:

	By Experiment.		By Calculation
Phosphoric acid,	33.56	2 PO_5, . . .	33.70
Magnesia, . .	14.55	3 MgO, . . .	15.20
Water, . . .	51.89	24 Aq. . . .	51.00
	100.00		100.00

ART. XXI.—ON AMERICAN BROMINE.

By George W. Patrick.

(Extract from an Inaugural Essay.)

This interesting substance, within the last two years, has been found very abundantly in the bittern or mother liquor, remaining after the crystallization of salt from the evaporated waters of the Salt Springs, near Pittsburg, Pennsylvania; and from the facility with which it is now extracted, will undoubtedly prove a source of considerable revenue to those engaged in obtaining it.

Edward Gillespie, M. D., while a student, first discovered this substance in these waters by testing them for iodine. These waters yield about 1.13 per cent. of bromine, being nearly equal to the celebrated springs of Germany. The gentlemen now engaged in obtaining it have patented their process, which is said to be so simple and economical as to

enable them with very little labor to produce forty or fifty pounds of pure bromine per week. They have recently sent one hundred pounds of it to Europe, hoping to be able to bring it in successful competition with the German and French article, which for the last few years has commanded such a high price as to be little used in this country as a medicinal agent—being chiefly consumed in the daguerreotype process. This bromine has been pronounced by chemists here who have examined it, as purer than the European article as generally found in our markets. Its sensible properties are precisely similar to the foreign article, having the density, odour and colour belonging to this element. In one respect, however, I find a discrepancy. Bromine is stated by authors to be soluble in alcohol; but I have been unable to effect a proper solution of the American article in this menstruum, as it appears to decompose either strong or diluted alcohol, uniting with it in all proportions, and when a quantity of bromine is suddenly introduced into this liquid, the reaction is so violent as to occasion flashes of light and violent ebullition, until the bromine entirely disappears, and the liquid becomes colourless, having properties resembling ether, probably hydrobromic ether, inasmuch as the acid which it contains is generated by the contact of bromine and alcohol.

As a medicinal agent, bromine is sometimes employed in an uncombined state, mixed with syrup of sarsaparilla or other similar vehicle; but it has been more frequently exhibited in the forms of the bromides of potassium and of iron. Three processes have been employed in obtaining the former. The first by decomposing a solution of bromide of iron with carbonate of potassa, as directed by the London Pharmacopœia; the second by passing a current of hydrosulphuric acid into bromine under water, until all the free bromine has disappeared, and saturating the solution of hydrobromic acid with carbonate of potassa; and lastly, by saturating a strong solution of caustic potassa with bro-

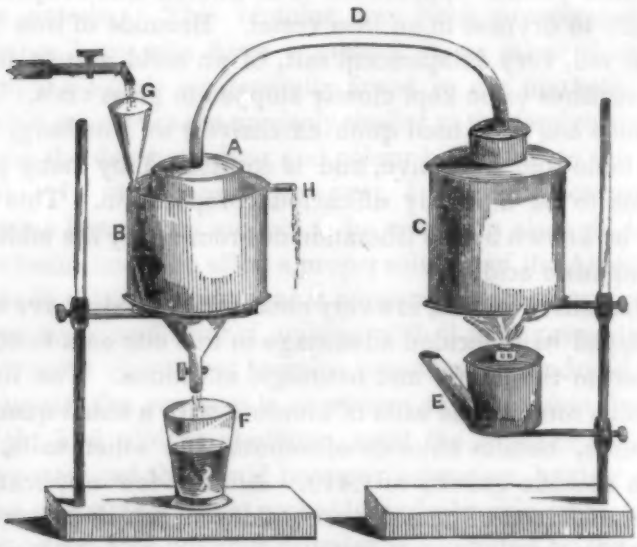
mine, evaporating to dryness, and heating the dried mass to a red heat to decompose the bromate of potassa which is mixed with the bromide. I consider this process the best, as it yields the purest salt in the most perfect crystals.

Bromide of Iron. This salt is obtained by adding bromine to iron filings in excess under water, and submitting them to a moderate heat. When the liquid assumes a greenish yellow appearance it is filtered and evaporated rapidly to dryness in an iron vessel. Bromide of iron is a brick red, very deliquescent salt, of an acrid styptic taste, and requires to be kept closely stopped in glass vials. This bromide has been used quite extensively in Pittsburg, Pa., as a tonic and alterative, and is considered by many physicians to be a highly efficacious preparation. This salt may be known by the liberation of bromine, by the addition of sulphuric acid.

The bittern waters, in a very concentrated state, have been employed with decided advantage in this city as a counter irritant in rheumatic and neuralgic affections. The liquid contains some of the salts of bromine with a small quantity of iodine, besides chloride of sodium and other salts, and has a specific gravity of 1.419. After a few applications a plentiful crop of pustules are produced, which pass away in a short time after ceasing its use. There is little doubt that this article will prove to be an agent of considerable importance in the above named complaints. There are several other preparatinos of bromine which have occasionally been used in medicine; they are prepared like the corresponding iodides; among these the bromide of sulphur has been used with advantage in cutaneous affections. It is formed by the direct union of its elements,—a compound of bromine and iodine, has been much used in daguerreotype operations.

ART. XXII.—OBSERVATIONS ON A NEW DISPLACEMENT APPARATUS, INVENTED AND PATENTED BY CHARLES AUGUSTUS SMITH, OF CINCINNATI.

BY WILLIAM PROCTER, JR.



A. The displacement cylinder with a tin diaphragm at its base.

B. The refrigerator surrounding the displacer, and which is kept supplied with cold water by means of the pipe and funnel *G*.

C. Is the boiler or vessel containing the menstruum intended to act on the ingredients.

D. Is a leaden tube connecting the boiler with the top of the displacer.

E. Is the source of heat, which may be a large Argand burner, or it may with propriety be a small furnace, or the top of a stove.

The instrument figured above has been invented by C. Augustus Smith of Cincinnati, with a view to the extraction of the soluble matter of drugs; and he has taken steps to procure a patent, securing him the pecuniary benefit of his

invention. The propriety of this course of the inventor, in thus withholding the free use of his invention from the Pharmaceutical public, it is not for us to discuss; nor are we altogether confident that his claims to originality in the principles of his machine can be satisfactorily maintained—but so far as it is designed to improve the Pharmacy of our country, we wish its inventor success.

At the request of Charles R. Smith who brought the apparatus to this city, and who is one of the proprietors of the patent, several experimental trials have been made with it, with the design of testing its powers; and the object of this paper is to exhibit the results of these trials in a fair, unbiassed statement.

As exhibited above, the machine consists essentially of a refrigerated displacer, a boiler, and a tube connecting these, through which the vapour passes from the latter to the former. In operating with this instrument, the substance to be treated, in the state of coarse powder, is placed on the diaphragm in the displacer, and should be sufficient in quantity to fill it within a short distance of the top, or as a general rule as high as the surface of the water in the refrigerator. The boiler should contain the menstruum destined to act on the ingredients in the displacer, and should be greater in quantity than the amount of product sought after, by at least fifty per cent. The boiler and displacement cylinder are then connected by the leaden tube to which is attached the lids, and the joints secured by luting. A current of cool water is conducted to the bottom of the refrigerator, whilst the warm fluid is carried off by the pipe at the top. Heat is then applied to the boiler and as the only outlet for the vapour is through the substance in the displacer, it becomes condensed in its passage amongst the particles and gradually saturates the whole mass. As soon as this is effected the saturated fluid commences to pass into the vessel below.

The first substance operated upon was uva ursi in coarse powder, and the menstruum, water. The first few ounces of fluid which passed was almost colorless, owing to the steam nearly all condensing on the cool sides of the displacer, and passing down its surface without acting to any extent on the leaves; but soon after, the product was highly charged with color and taste, and was found to contain twenty five per cent of solid extract by evaporation. The proportion gradually decreased, until the last runnings possessed but little color or taste. When the operation was concluded, the leaves were found comparatively free from moisture, and the portion nearest the sides of the displacer entirely exhausted of astringency. The central part, however, retained to a considerable degree its peculiar taste, which will be noticed in the sequel.

The second experiment was with Jamaica ginger, and the menstruum used was alcohol. The first part of the product was highly concentrated and colored. The operation was continued till as much product had passed, as the amount of ginger required for the officinal tincture. The last runnings were yet charged with the taste and odor of ginger, but very much less so than the first. The tincture obtained, however, was fully equal to that made in the ordinary way, and four pints were made in as many hours by the heat of a gas burner;—the time occupied of course depends on the greater or less rapidity of the vaporization of the menstruum in the boiler, and of its condensation in the displacer.

The third trial was with senna, the menstruum being water. It is well known that in treating senna by displacement, it has been found necessary to use diluted alcohol, owing to the large amount of mucilage in the leaves. When, however, the water is applied in this apparatus, no difficulty is experienced, and the operation proceeded as successfully as in the other cases mentioned, the senna being merely bruised.

The inventor of the machine has stated that it can be applied in the preparation of hydro-alcoholic tinctures, in the same way that water or alcoholic preparations are made, but it must appear that in boiling diluted alcohol, the first portion that distils over will be more highly alcoholic than the last. In order to test the apparatus fairly, a substance was chosen which contained a resinous active principle, which would be precipitated from the first alcoholic liquid by the subsequent watery product, should it turn out that the alcohol vaporized first. This supposition was fully realized by experiment with Helleborus niger in coarse powder. The first product was extremely bitter, but was so strongly alcoholic that it marked 30° Baumé, notwithstanding it contained the resinous matter of the root. As the process proceeded, the liquid became less alcoholic, and cloudy, and when finished the whole product had the aspect of muddy water. By standing, a portion of flocculent matter rose to the surface, and some precipitated. This cloudiness is not objectionable in making the extract, but for the tincture it would require a new filtration.

The fifth trial was made with Krameria, with water as a menstruum, with the design of making an extract. The same concentrated solution was obtained at first as in the other cases, but although the liquid passed transparent, as soon as it cooled, a brick colored precipitate of apotheme was deposited. It follows, therefore, that, as applied to rhatany, the objections of ebullition are equally applicable to this process, except in so far, that in this case the substance is not acted on by the atmosphere during the action of the menstruum.

In exhausting substances which contain fecula by water, this method is not greatly superior to boiling, when the presence of the starch in the product is objectionable, because the temperature of the condensed menstruum is sufficient to rupture the granules of fecula, as has been tried with sarsaparilla. When, however, the object is to prepare infu-

sions or decoctions to be used as such, or to be made into extracts or fluid extracts it may be applied with advantage. Where the menstruum is homogeneous as water, or alcohol, the process works very well, but when mixed liquids like diluted alcohol are to be vaporized, the greater volatility of one than the other is a strong objection.

A process somewhat like this has been patented in Europe for extracting the coloring matter from dyewoods, which consists in saturating the wood in fine chips or shavings with steam, and when they are swelled with condensed vapour, boiling water is poured on and boiled. The apparatus under consideration will no doubt answer for the same use, with the additional advantage of giving a concentrated infusion or rather decoction.

With reference to the working of the apparatus, apart from its principle of action, it may be remarked, that as the condensing surface is applied merely to the external surface of the ingredients in contact with the sides of the displacer, it follows that that portion of the substance receives the action of the largest portion of the condensed vapour. It may easily be conceived that the central portion of the ingredients for some depth may become so hot as not to condense the vapour, and consequently to receive but little action from the condensed fluid, which is in accordance with experiment. In the case of black hellebore, above stated, while that portion of the root near the sides of the displacer was tasteless, the central portion, amounting to about one-fourth or one-fifth of the whole, was strongly bitter, notwithstanding a larger amount of menstruum had been employed than was directed for that quantity of root. The same was found to occur in the case of the ginger, although to a less extent. This difficulty might be remedied by having the substance placed between two concentric cylinders with cool water applied to each surface, which would increase the surface of condensation.

There is a decided advantage obtained by permitting the vapour to pass over and condense among the particles of

the substance for some time before the water is introduced into the refrigerator, as by this means all parts of the substance become swelled and moistened to a certain extent.

Among the advantages to be gained by this instrument, according to the inventor, is the invariable use of distilled water, which in limestone regions is of some importance. The great density of the product is also an advantage in those cases requiring evaporation. Upon the whole, with certain modifications in the condensing arrangement, I believe this instrument may become useful in many pharmaceutical processes, particularly in the preparation of extracts.

ART. XXIII.—AN ESSAY ON ALCOHOLIC TINCTURES.

BY M. JAQUES PERSONNE.

(Continued from page 21.)

4. *Nux Vomica.*

						grs.
1 pt. or 15 gr.	by 60 gr.	or 4 pts.	alc. at 80°	total ext. of tinct.		2·69
" 75	" 5	"	id.	"		1·10
" 60	" 4	"	56	"		1·28
" 75	" 5	"	id.	"		1·38
" 90	" 6	"	id.	"		1·32
" 75	" 5	"	45	"		1·44
" 90	" 6	"	id.	"		1·38

Quantity of the Alkaloid.

In 200 grs. of tinc. made with—

1 pt. nux vomica and 5 pts.	alc. at 80°	precip. obtained	1·126
"	" 56	"	1·382
"	" 45	"	1·042

Alcohol at 56°, being that which dissolves the greatest quantity of strychnine, should be preferred, and also the proportion of 5 pts., being that which furnishes the greatest

portion of soluble matters. The Codex prescribes alcohol at 80°.

5. *Jalap.*

								grs.
1 pt.	15	gr.	by 60	gr.	or 4	pts.	alc. at 90°	total ext. of tinct. 3·75
"	60	"	4	"	80	"		4·44
"	75	"	5	"	id.	"		5·21
"	90	"	6	"	id.	"		5·26
"	105	"	7	"	id.	"		5·29
"	60	"	4	"	70	"		4·36
"	60	"	4	"	56	"		5·50

Quantity of the Resin.

				grs.
100 gr. tinc. made with 1 pt. jalap & 5 pts. alc. at 90°				resin obtained 4·38
100	"	"	80	4·850
100	"	"	70	3·825
100	"	"	56	2·745

I should employ alcohol at 80° for the preparation of this tincture, because it was proved by experiment that that degree is the most favorable for the purpose of dissolving the greatest portion of the resin, the active principle, which it is our object to obtain in this medicament. I should also adopt the proportion of five parts of this solvent, because the excess of matter dissolved by a larger quantity of the liquid is so trifling that it may be passed over.

The Codex employs alcohol at 56°, which, as we see, dissolves a much smaller proportion of the resin than the preceding.

6. *Ipecacuanha.*

								grs.
1 pt.	15	gr.	by 60	gr.	or 4	pts.	alc. at 80°	total ext. 2.02
"	75	"	5	"	id.	"		2·12
"	60	"	4	"	56	"		3·02
"	75	"	5	"	id.	"		3·21
"	90	"	6	"	id.	"		3·11
"	75	"	5	"	46	"		1·80

In this case I was not able to ascertain the quantity of the alkaloïd it contained. We know, in fact, that impure emetine is precipitated from its solution by acetate of lead. But we know the great solubility of this alkaloïd in water, which makes its preparation difficult; on this account they have chosen in the Codex alcohol at 56°, for the preparation of this tincture.

This strength of alcohol being that which dissolves the greatest quantity of the matter, as we see in the above table, I should give it the preference, as well as the proportion of 5 parts of this solvent which takes up an excess of matter equal to 0·19.

7. *Rhubarb.*

						grs.
1 pt.	15 gr.	by 60 gr.	or 4 pts.	alc. at 80°	total ext. of tinct	6·00
"	75 "	5 "	"	id.	"	6·34
"	60 "	4 "	"	56	"	6·44
"	75 "	5 "	"	id.	"	6·89
"	90 "	6 "	"	id.	"	6·81
"	75 "	5 "	"	45	"	6·80
"	90 "	6 "	"	id.	"	6·74

The two last were extremely mucilaginous.

I endeavored to discover in which of these tinctures the bitterness would remain, after the addition of water. 10 grammes of each of these tinctures, prepared with one part rhubarb and five of alcohol at 56° and 80°, were diluted with the same quantity of water (400 gr.): the tincture with the alcohol at 80°, was cloudy, and still rather bitter; that prepared with alcohol at 56° remained transparent, and had no longer a bitter taste; from which we may conclude that alcohol at 80° dissolves more of the active principle.

But, as we know that this tincture is often administered in an undiluted state, in that case alcohol at 80° would be far too strong a spirit. I think, therefore, that it would be better, on this account, as in the Codex, to adopt alcohol at 56° only. I should choose the proportion of five parts of

the solvent, which is that which takes up the greatest quantity of extractive matter from this substance.

8. *Wormwood.*

							grs.
1 pt.	15 gr.	by	60 gr.	or	4 pts.	alc. at 80° total ext.	2·20
"	75 "		5	"	id.	"	2·67
"	60 "		4	"	56	"	2·91
"	75 "		5	"	id.	"	3·58
"	96 "		6	"	id.	"	3·11
"	75 "		5	"	45	"	3·53
"	90 "		6	"	id.	"	3·50

20 grammes of the tincture, prepared with one part of wormwood, and five parts of each of the different degrees of alcohol mentioned above, were diluted with the same quantity of water (400 grammes); the bitter taste of all these tinctures, although much reduced, could still be perceived, but I could not establish the difference in the degree of bitterness presented by each. This fact I had proved by others, not wishing to trust to myself alone.

As all these tinctures possessed the same properties, since it is the bitter principle we are in search of in this medicament, and, as in the preceding case, this tincture is also administered in an undiluted state, I saw no necessity for changing the strength of the alcohol prescribed by the Codex.

I therefore employed alcohol at 56°, in the proportion of five parts, which, as we see in the table, furnishes the greatest quantity of extract.

9. *Gentian.*

							grs.
1 pt.	15 gr.	by	60 gr.	or	4 pts.	alc. at 80° total ext.	4·75
"	75 "		5	"	id.	"	4·89
"	75 "		5	"	70	"	5·34
"	90 "		6	"	id.	"	5·29
"	60 "		4	"	56	"	5.24
"	75 "		5	"	id.	"	5·22
"	75 "		5	"	45	"	4·95

This substance was tested like the preceding. The tinctures subjected to the proof were also prepared with one part of the substance, and five parts of alcohol of different degrees of strength, and as we were unable to decide upon the difference in the degree of bitterness, exhibited by each of these tinctures, after having been diluted with the same quantity of water, I see no necessity for changing the degree of strength adopted in the Codex, especially as this tincture, like the two preceding, is often administered alone. I should, therefore, recommend alcohol at 56°.

Here again, as we see, is an exception to the general rule, which is, that four parts give more extract than five parts, but, I repeat, that as there is certainly an advantage in employing the same proportions in the greatest possible number of cases, I should adopt the proportion of 5 parts of alcohol.

10. *Foxglove.*

							grs.
1 pt.	15 gr.	by	60 gr.	or	4 pts.	alc. at 80° total ext.	3·65
"	75 "	"	5	"	id.	"	4·11
"	60 "	"	4	"	56	"	5·47
"	75 "	"	5	"	id.	"	5·66
"	90 "	"	6	"	id.	"	5·80
"	75 "	"	5	"	45	"	5·02

Instead of alcohol at 80°, as directed by the Codex, I should, in this case, adopt alcohol at 56°, because, as we perfectly well know, especially since the work of M. Homolle, the active principle of digitalis is very readily dissolved by water. For a long time, also, no one has been ignorant of the caution with which tincture of digitalis ought to be administered, on account of its powerful effects. I here also give the preference to the proportion of five parts of the solvent, neglecting the small excess of matter dissolved by six parts.

11. *Belladonna.*

							grs.
1 pt.	15 gr.	by	60 gr.	or	4 pts.	alc. at 80° total ext.	1·90
"	60	"	4	"	56	"	2·35
"	75	"	5	"	id.	"	2·46
"	90	"	6	"	id.	"	2·49
"	75	"	5	"	45	"	2·50
"	90	"	6	"	id.	"	2·44

We see, in this case, that alcohol at 80° dissolves less matter than alcohol at 56°, and that five parts of the latter dissolve rather more than four. Which of these solvents has dissolved the greatest quantity of the active principle? Atropine is extremely soluble in concentrated alcohol; but we also know that this active principle also exists in the plant in a state of combination, perfectly soluble in water; on this account, alcohol, at 56°, has been admitted by the Codex in the preparation of this tincture. Besides, the tincture prepared with alcohol at 80° is green, and consequently, loaded with chlorophylle, an inert substance; while the other tinctures contain an imperceptible quantity of this principle. We also see that there is no sensible difference between the quantity of extract obtained by means of alcohol at 56° and alcohol at 45°.

12. *Stramonium.*

							grs.
1 pt.	15 gr.	by	60 gr.	or	4 pt.	alc. at 80° total ext.	2·36
"	60	"	4	"	56	"	3·05
"	75	"	5	"	id.	"	3·15
"	90	"	6	"	id.	"	3·14
"	75	"	5	"	45	"	3·95
"	90	"	6	"	id.	"	4·10

The active principle of this substance, as well as that of belladonna, on the same account, is extremely soluble in water, the Codex, therefore, directs the use of alcohol at 56° in the preparation of this tincture. But these experiments prove that the difference between the quantity of matter

dissolved by alcohol at 56°, and alcohol at 45°, being 0·81, is sufficient in amount not to be neglected, and that the preference ought to be given to the latter solvent.

The excess of extract furnished by six parts of the solvent is so trifling that it may be neglected, and the proportion of five parts can be adopted.

13. *Henbane.*

							grs.
1 pt.	15 gr.	by	60 gr.	or 4 pts.	alc. at 80°	total ext.	1·53
"	60	"	4	"	56	"	3·09
"	75	"	5	"	id.	"	3·24
"	80	"	6	"	id.	"	3 29
"	75	"	5	"	48	"	4·37
"	90	"	6	"	id.	"	4·24

The Codex has adopted, for the same reason as in the two preceding cases, alcohol at 56° in the preparation of this tincture; here, also, the excess of matter dissolved by alcohol at 45° is too great to be neglected, since it amounts to 1·08. I, therefore, should employ for these three substances alcohol at 45°, and the proportion of 5 parts of the solvent.

14. *Hemlock.*

							grs.
1 pt.	15 gr.	by	60 gr.	or 4 pts.	alc. at 80°	total ext.	2·95
"	60	"	4	"	56	"	4·20
"	75	"	5	"	id.	"	4·19
"	90	"	6	"	id.	"	4·23
"	75	"	5	"	45	"	4·92
"	90	"	6	"	id.	"	4·86

The Codex, on account of the great solubility in water of the salts of conicine, has adopted alcohol at 56° for this tincture. We perceive in fact a great difference between the quantity of soluble matter taken up by alcohol at 80°, and alcohol at 56°; we also see that there is a difference of 0·69 between the quantity dissolved by the latter, and alcohol at 45°. This excess of soluble matter is perhaps at-

tributable to inert gummy or mucilaginous matters, but, on the other hand, the tincture, with alcohol at 56° is green, and consequently contains chlorophylle, also an inert substance. As in these cases there is a compensation on both sides, I give the preference to the alcohol that furnishes the greatest quantity of soluble matters, and consequently I should adopt alcohol at 45° in the proportion of five parts.

15. *Monkshood.*

							grs.
1 pt.	15 gr.	by	60 gr.	or 4 pts.	alc. at 80°	total ext.	1·98
"	60	"	4	"	56	"	2·96
"	75	"	5	"	id.	"	2·95
"	75	"	5	"	45	"	3·60
"	90	"	6	"	id.	"	3·65

The second and third of these extracts were rather green, the four and fifth were not so.

The Codex directs alcohol at 56° for this tincture, because aconitine existing in the plant, under the form of a salt, like the other alkaloïds, it is consequently easily dissolved in water. On this account I prefer alcohol at 45°, because the excess of matter taken up by the alcohol being 0·65, is large enough not to be neglected. I should also adopt the proportion of five parts of this solvent, being that which furnishes the greatest quantity of extract.

16. *Senna.*

							grs.
1 pt.	15 gr.	by	75 gr.	or 5 pts.	alc. at 80°	total ext.	2·54
"	60	"	4	"	56	"	3·62
"	75	"	5	"	id.	"	3·70
"	90	"	6	"	id.	"	3·69
"	75	"	5	"	45	"	3·96
"	90	"	6	"	id.	"	4·08

The last two were very mucilaginous.

Agreeing with the Codex, I should give the preference to alcohol at 56°, because it is well known that the active principle of senna (cathartine) is easily dissolved in alcohol

and water. I do not adopt alcohol at 45° although it yields a larger quantity of extract, because the tincture obtained with alcohol of this strength is so extremely viscous, that it is filtered with difficulty, and the excess of product obtained is certainly only due to the mucilaginous matters, which are inert, and uselessly increase the mass; the tincture prepared with alcohol at 56° is equally full flavored, and much less mucilaginous. I should also prefer the proportion of five parts of this solvent, although the quantity of matter dissolved is very small.

17. *Leaves of the Asarum.*

							grs.
1 pt.	15 gr.	by	60 gr.	or	4 pts.	alc. at 80° total ext.	1·96
"	60 "	"	4	"	56	"	2·28
"	75 "	"	5	"	id.	"	2·99
"	90 "	"	6	"	id.	"	3·27
"	75 "	"	5	"	45	"	3·87
"	90 "	"	6	"	id.	"	3·69

This substance, as we know, owes its active properties to a principle which is soluble in water, (citisine or cathartine,) and perhaps, also, to a small quantity of fat oil, and essential oil. The citisine, being extremely soluble in water, we may readily perceive that weak alcohol will have the double advantage of dissolving this substance, and at the same time the greatest portion of the fatty matters which are probably not devoid of action.

I should, therefore adopt alcohol at 45°, as well as the proportion of five for the solvent, which as we see by the table, is that which takes up the greatest portion of the soluble matter.

18. *Bulbs of the Meadow Saffron.*

							grs.
1 pt.	15 gr.	by	60 gr.	or	4 pts.	alc. at 56° total ext.	2·56
"	75 "	"	5	"	id.	"	2·89
"	90 "	"	6	"	id.	"	3·29
"	75 "	"	5	"	80	"	1·79
"	75 "	"	5	"	45	"	3·35
"	90 "	"	6	"	id.	"	3·30

The Codex directs alcohol at 56°, for the preparation of this tincture, properly calculating on the fact, that gallate of veratrine, to which this bulb is indebted for its properties, is extremely soluble in water. We also know that wine, a vehicle containing very little alcohol, and vinegar, readily dissolve the active portion of this substance. I, therefore, give the preference to alcohol at 45°, a liquid containing twice as much alcohol as wine; for as we see by the table, five parts of this vehicle dissolve more of the extractive matters, than five parts of alcohol at 56°, the proportion to be employed would also be five parts.

19. *White Hellebore.*

							grs.
1 pt.	15 gr.	by	60 gr.	or	4 pts.	alc. at 80° total ext.	3·82
"	60 "	"	4	"	56	"	4·62
"	75 "	"	5	"	id.	"	4·87
"	90 "	"	6	"	id.	"	4·81
"	75 "	"	5	"	45	"	5·15
"	90 "	"	6	"	id.	"	5·27

For the same reason as in the case of the bulbs of meadow saffron, I give the preference to alcohol at 45°, and in the proportion of five parts, rejecting to maintain the general rule, on account of the small excess taken up by an additional part of the same solvent; the Codex prescribes alcohol at 55°.

20. *Valerian Root.*

							grs.
1 pt.	15 gr.	by	60 gr.	or	4 pts.	alc. at 56° total ext.	2·56
"	75 "	"	5	"	id.	"	2·89
"	90 "	"	6	"	id.	"	3·03
"	75 "	"	5	"	70	"	2·77
"	75 "	"	5	"	80	"	2·32
"	75 "	"	5	"	45	"	3·46
"	90 "	"	6	"	id.	"	3·50

Considering that water, and consequently weak alcohol, completely dissolves the valerianic acid, the active principle

of the valerian root, I preferred alcohol at 45°, which dissolves the greatest quantity of extractive matter. I also adopt the proportion of five parts of this solvent, for six parts take up no more extract. The Codex directs alcohol at 56°.

21. *Squills.*

							grs.
1 pt.	15 gr.	by	60 gr.	or 4 pts.	alc. at	80°	total ext. 3·89
"	75 "	"	5	"	id.	"	7·09
"	75 "	"	5	"	70	"	9·37
"	60 "	"	4	"	56	"	10·21
"	75 "	"	5	"	id.	"	10·92
"	90 "	"	6	"	id.	"	9·66
"	75 "	"	5	"	45	"	10·17

The Codex prescribes alcohol at 56° for this substance; I have not changed the strength of the alcohol, because experiment has proved to me that it is that which best dissolves the soluble parts of the squill, I only adopt the proportion of five parts, which, as we see, produces the greatest quantity of extract.

22. *Black Hellebore.*

							grs.
1 pt.	15 gr.	by	60 gr.	or 4 pts.	alco. at	80°	total ext. 3·22
"	75 "	"	5	"	id.	"	3·20
"	75 "	"	5	"	56	"	4·34
"	90 "	"	6	"	id.	"	4·37
"	75 "	"	5	"	45	"	2·92

We generally attribute the medical properties of this root to a compound consisting of a volatile acid and a fat substance; on which account alcohol at 80° has been employed for the preparation of this tincture. But if we consider that, according to my experiments, alcohol at 45°, which is the most capable of dissolving the gummy and extractive matters, nevertheless takes up much less of the soluble parts

of this root than alcohol at 56°, the conclusion will be, in my opinion, that the last ought to be preferred, for it dissolves a larger quantity than alcohol at 80°. I should even say that alcohol at 56°, as it more readily dissolves the extractive matters, ought to render the solution of the fat substances more easy, because by the disintegration of the extractive matters, it will find itself in close contact with the first. Probably, also, these extractive matters once dissolved, may assist in the solution of the others. Do we not every day see this effect produced, when we treat with water substances containing a mixture of these different substances? The water extract of guaiacum, for example, contains resin, which certainly has been removed by the extractive principle.

I, therefore, give the preference to alcohol at 56° and the proportion of five parts, for it is evident we may neglect the small excess of matter dissolved by one more part of this solvent.

23. *Roots of Asarum.*

							grs.
1 pt.	15 gr.	by	60 gr.	or	4 pts.	alc. at 80° total ext.	1·90
"	75 "	"	5	"	id.	"	1·00
"	60 "	"	4	"	56	"	3·34
"	75 "	"	5	"	id.	"	3·29
"	90 "	"	6	"	id.	"	3·30
"	75 "	"	5	"	45	"	3·09

I should adopt alcohol at 56° for this tincture, because at that strength it takes up more of the soluble matters, and the root contains rather more of the fatty principle than the leaves. I also recommend the proportion of five parts of this vehicle, although only four parts would be sufficient, as we see by the table. What makes me prefer this proportion, is the fact that this tincture is but little employed, and more particularly to avoid the inconvenience of multiplying these different proportions of alcohol.

24. *Contrayerva.*

							grs.
1 pt.	15 gr.	by	60 gr.	or	4 pts.	alc. at 80° total ext.	1·15
"	75	"	5	"	id.	"	1·31
"	75	"	5	"	56	"	2·29
"	90	"	6	"	id.	"	2·22
"	75	"	5	"	45	"	1·57

No analysis having as yet shown the nature of the active principle of this substance, I choose that degree of strength which furnishes the greatest portion of soluble matter, and consequently I select alcohol at 56°, and the proportion of five parts, which is that which dissolves most of the substance.

25. *Milk Wort.*

							grs.
1 pt.	15 gr.	by	60 gr.	or	4 pts.	alc. at 80° total ext.	4·88
"	75	"	5	"	id.	"	5·06
"	75	"	5	"	56	"	6·27
"	90	"	6	"	id.	"	6·36
"	75	"	5	"	45	"	6·09

Water, as we know, readily dissolves the active principle of polygala, polygalic acid, I should, therefore, give the preference to alcohol at 56°, which furnishes the greatest quantity of extract, and is certainly preferable to alcohol at 80° for the extraction of this principle, because the pectic acid, gum, and albumen contained in this root, are certainly coagulated by this last vehicle, and thus prevented coming in contact with the active matter; and as we may also reject the trifling excess of matter dissolved by six parts of alcohol, I choose the proportion of five parts of this solvent.

26. *Pellitory of Spain.*

							grs.
1 pt.	15 gr.	by	60 gr.	or	4 pts.	alc. at 80° total ext.	1·24
"	75	"	5	"	id.	"	1·82
"	90	"	6	"	id.	"	1·64
"	75	"	5	"	90	"	1·20
"	60	"	4	"	56	"	2·13
"	75	"	5	"	id.	"	2·20
"	75	"	5	"	45	"	2·18

The first four of these extracts are extremely resinous, the three last only so in a trifling degree.

As the active principle of this substance is solely due to a resinous matter, insoluble in water, I have not changed the strength of the alcohol recommended in the Codex. In fact, I am convinced that in dissolving the extracts obtained, those prepared by strong alcohol were extremely resinous, while, on the contrary, those prepared by weak alcohol were much less so. I, therefore, recommend alcohol at 80°, giving a preference to the proportion of five parts of this solvent, being that which takes up the greatest quantities of the soluble parts of the root.

27. *Ginger.*

							grs.
1 pt.	15 gr.	by	60 gr.	or	4 pts.	alco. at 80° total ext.	0·54
"	60	"	4	"	56	"	1·52
"	75	"	5	"	id.	"	1·75
"	75	"	5	"	45	"	2·01
"	90	"	6	"	id.	"	1·80

This root owes its effects to a soft resin: on that account the Codex has directed the use of alcohol at 80° for this tincture. But if, on the one hand, we consider the enormous difference between the quantity of matter dissolved by alcohol of that strength, and alcohol at 56°, and, on the other hand, that this resinous matter may be perfectly removed by means of the extractive matter, alcohol at 56°, and 5 pts. of this solvent will be employed according to my plan, and this is the proportion also that takes up the greatest quantity of the soluble matter.

28. *Cinnamon.*

							grs.
1 pt.	15 gr.	by	60 gr.	or	4 pts.	alco. at 80° total ext.	2.61
"	75	"	5	"	id.	"	2·69
"	90	"	6	"	id.	"	2·73
"	60	"	4	"	56	"	2·73
"	75	"	5	"	id.	"	2·80
"	60	"	4	"	45	"	2·70
"	75	"	5	"	id.	"	2·72

The two last tinctures are so mucilaginous, they can scarcely be filtered.

As we see by this table, there is no great difference between the quantities of matter dissolved by alcohol of these different degrees of strength, but, considering that the weaker the alcohol is, the more mucilaginous the tinctures are, and that the active principle of this bark resides in its essential oil, I give the preference, as in the Codex, to alcohol at 80°; and rejecting the trifling excess of matter dissolved by six parts of this solvent, I should adopt the proportion of five parts.

29. *Saffron.*

							grs.
1 pt.	15 gr.	by	60 gr.	or	4 pts.	alco. at 80° total ext.	8·10
"	60	"	4	"	70	"	8·69
"	60	"	4	"	56	"	9·06
"	75	"	5	"	id.	"	10·86
"	90	"	6	"	id.	"	10·80
"	60	"	4	"	45	"	8·89
"	75	"	5	"	80	"	8·71

The last two tinctures are very mucilaginous. We see according to these experiments, that weak alcohol at 55° extracts more from the saffron than alcohol at 80°; but, as it has been observed that a tincture prepared with weak alcohol, deposits, after a certain time, a considerable quantity of coloring matter, and that it can, therefore, be no longer identical in composition, while that prepared with alcohol at 80°, is much more stable, I retain, according to the Codex, alcohol at 80, for the preparation of this tincture, only I should employ five parts of this solvent, which is the proportion that produces the greatest quantity of extract from the same weight of the substance.

30. *Castoreum.*

							grs.
1 pt.	15 gr.	by	60 gr.	or	4 pts.	alco. at 90° total ext.	6·00
"	75	"	5	"	id.	"	6·30
"	60	"	4	"	80	"	6.60
"	75	"	5	"	id.	"	6.50
"	75	"	5	"	70	"	6.05
"	60	"	4	"	56	"	6·00
"	75	"	5	"	id.	"	5.95

It is very probable that castoreum owes its properties to a compound consisting of volatile oil, castorine, and a small quantity of resin; this caused the adoption, in the Codex, of alcohol at 80° in the preparation of this tincture (my experiments confirm me in the use of this alcohol). We see, in fact, by the table, that alcohol at 80° the most perfectly extracts this substance. I also observed, by evaporating these various tinctures, that those prepared with alcohol at 90° and 80°, remained homogeneous during the evaporation, while those prepared with 70° and 56°, immediately separated into two portions; one layer being watery and transparent, in the midst of which a resinoid mass floated. Hence I conclude, that these two alcohols had dissolved a smaller quantity of the active principles, and a much greater quantity of the albuminous substances. I, therefore, adhere to the degree employed in the Codex, and although 4 parts of this solvent would be sufficient completely to exhaust this substance, I return, nevertheless, to the general rule, adopting the proportion of 5 parts of alcohol, for the number of similar cases are too few to require exception.

31. *Cantharides.*

							grs.
1 pt.	15 gr.	by	60 gr.	or	4 pts.	alco. at 56° total ext.	2·2[illegible]
"	75	"	5	"	id.		2·67
"	90	"	6	"	id.		3·03
"	75	"	5	"	80		1·12
"	75	"	5	"	45		3·25
"	90	"	6	"	id.		3·18

The last two tinctures were very mucilaginous.

My only object in making experiments on this substance was to ascertain what quantity of alcohol was most proper to remove the greatest amount of soluble matter, and consequently, to describe a new proportion of this vehicle; it would be dangerous, perhaps, to alter the proportion adopted by the Codex, on account of the great power of the medicine. I only wished to ascertain what strength of alcohol was the best. We see, according to the results exhibited in this table, that preference ought to be given to alcohol at 56°, which justifies the employment of this vehicle, according to the Codex.

32. *Myrrh.*

						grs.
1 pt.	15 gr.	by	60 gr.	or 4 pts.	alco. at 90° total ext.	4·12
"	75	"	5	"	id.	3·57
"	90	"	5	"	id.	3·06
"	60	"	6	"	80	4·18
"	75	"	5	"	id.	4·38
"	90	"	6	"	id.	4·50
"	60	"	4	"	70	4.23
"	75	"	5	"	id.	4·18
"	90	"	6	"	id.	4.26
"	60	"	4	"	56	2 32
"	75	"	5	"	id.	3·25

The results of these experiments are sufficient without commentary, to prove that the most favorable strength of the alcohol is 80°, and the proportion of the solvent five parts, for the excess taken up by a larger quantity of alcohol, is very trifling. The Codex directs the use of alcohol of the same strength.

Thus we see the number of substances, on which I have experimented, amount to 32, and the number of experiments are sufficiently considerable to enable me to draw the following conclusions from their results:—

CONCLUSIONS.

1. The degrees of strength of the alcohol prescribed by the Codex, are not always the most favorable for the solution of the largest quantity of the principles contained in the substances employed in the preparation of tinctures.

2. These degrees of strength can scarcely be admitted in a general manner, and by analogy, excepting in the case of a certain number of substances. Experiment alone can determine which is the best in each case.

3. The proportion of four parts of alcohol, for one of the substance employed in the Codex, is scarcely, in any case, sufficient to dissolve, entirely, the soluble parts of these bodies. The cases in which this proportion is sufficient are so rare as to prevent any generalisation.

4. The quantity of alcohol necessary entirely to exhaust a substance, is, in general, five parts of alcohol for one of the substance. In certain cases, however, but extremely rarely, this proportion is not quite strong enough, but the excess of matter dissolved is so trifling, that it may be left out of the question in laying down a general rule.

5. The quantity of alcohol is always sufficient to exhaust a substance, when that solvent is in sufficient quantity to cover it, and when the substance is herbaceous, as in the case of leaves.

6. The degrees of strength of the alcohol, which I have found most adapted for the preparation of different tinctures are 80°, 56°, 45°.

We shall find these different degrees of strength arranged in the following table, along with the substances for which they are adapted. I have also added, in the case of each of these tinctures, the quantity of substance equivalent to 1 gramme of the tincture.

Before I conclude I must mention a singular fact, which, as we may perceive, presented itself in almost every experiment: in almost every instance when the proportion of

alcohol was too great, I always obtained less extract than when it was just enough; that is to say, the more I increased the quantity of the alcohol, the more the quantity of extract was decreased.

This fact, analagous to that which I have often observed when water is added to a concentrated solution of opium when we see substances precipitated that were previously held in solution; this fact, I say, sufficiently proves, that there is a great inconvenience in too much increasing the proportion of alcohol in the preparation of tinctures; for, besides that, the density of the tincture would be diminished by this addition of alcohol, it would be still more so, by the precipitation of a certain quantity of matter, as occurs in the case of the solution of opium.

A Table of the different strength of Alcohol to be employed in the preparation of each substance.

We prepare, with one part of the substance and 5 parts of alcohol at 80°, the tinctures of—

Yellow bark	1 gr. of tincture,	equal to	0·20	in powder.
Jalap,	1 gr.	"	0·19	
Cinnamon,	1 gr.	"	0·20	"
Pellitory of Spain,	1 gr.	"	0·20	"
Saffron,	1 gr.	"	0·17	"
Castoreum,	1 gr.	"	0·18	"
Myrrh,	1 gr.	"	0·19	"

1 part of the substance and 5 parts of alcohol at 56° for the following tinctures:—

Rhubarb,	1 gr. of tincture,	equal to	0·18	in powder.
Wormwood,	1 gr.	"	0·19	"
Gray bark,	1 gr.	"	0·20	"
Ipecacuanha,	1 gr.	"	0·19	"
Nux vomica,	1 gr.	"	0·20	"
Gentian,	1 gr.	"	0·18	"
Red Bark,	1 gr.	"	0·20	"
Foxglove,	1 gr.	"	0·18	"

Senna,	1 gr. of tincture equal to	0·19	in powder.
Squills,	1 gr. "	0·17	"
Blk. hellebore,	1 gr. "	0·18	"
Root of asarum	1 gr. "	0·19	"
Contrayerva,	1 gr. "	0 20	"
Milkwort,	1 gr. "	0·18	"
Ginger,	1 gr. "	0·20	"

According to the Codex, 8 parts of alcohol at 56° are required for tincture of cantharides.

We prepare, with 1 part of the substance, and 5 parts of alcohol at 45°, the following tinctures :

Valerian root,	1 gr. of tinct. equal to	0·19	in powder.
White hellebore,	1 gr. "	0·18	"
Bulbs of meadow saffron,	1 gr. "	0·19	"
Leaves of asarum,	1 gr. "	0·19	"
Wolf'sbane,	1 gr. "	0·19	"
Hemlock,	1 gr. "	0·18	"
Belladonna,	1 gr. "	0·19	"
Henbane,	1 gr. "	0·18	"
Stramonium,	1 gr. "	0·18	"

As to the mode of preparing these tinctures, I think experience has sufficiently proved that of all the plans proposed, cold maceration is the best. *Chemist.*

* The author, in offering the opinion that cold maceration is the best, does it with reference to obtaining a saturated solution of the soluble matter of the drugs, without reference to economy, and by repudiating the employment of displacement as a means of obtaining the full amount of the saturated liquid after maceration, in many instances a loss of 30 per cent. will be the consequence, owing to the bulk of the ingredients. Expression is but an imperfect means of extracting the saturated fluid in numerous cases. It may be well to observe that the proportion of menstruum recommended by M. Personne, is less in most cases than that of our Pharmacopœia, and hence but few of the officinal tinctures are saturated solutions.—*Ed. Am. Journ. Pharm.*

ART. XXIV.—FURTHER NOTICE RESPECTING SIBERIAN AND BUCHARIAN RHUBARBS, WITH SOME REMARKS ON TASCHKENT RHUBARB.

By Jonathan Pereira, M. D., F. R. S.

In the paper published in the last number of the *Pharmaceutical Journal* on some rare kinds of rhubarb which have recently appeared in British commerce, I noticed four varieties of rhubarb. I have subsequently received from Mr. Faber some additional information respecting two of these, viz., the Siberian and Bucharian sorts, which I beg to communicate to the Society.

I may observe that the following information has just been received from one of the first drug-houses in St. Petersburg, namely, Messrs. Dyrssen & Co., than whom, Mr. Faber assures me, no person can be expected to give information upon which more reliance can be placed. The letter is dated March 18th.

1. *Siberian Rhubarb.*

In my former paper, I stated that the rhubarb which I called Siberian, had been sent to this country as Bucharian. But three circumstances led me to conclude that it was Siberian. First, it differed from Bucharian rhubarb which arrived here in 1840. Secondly, it was suggested by one of Mr. Faber's correspondents that it was not Bucharian but Siberian; and thirdly, it agreed with the Siberian rhapontic root described by Grassman.

My conclusions, it appears, are correct, and the drug firm above alluded to, in their letter to Mr. Faber, just received, observe, "from your minute description of the three chests of rhubarb, we are quite sure that it is and can be no other than our *Siberian radix rhapontica*. It is a distinct species, and is not the root branches of either Bucharian or crown rhubarb."

3. *Bucharian Rhubarb.*

The same firm, in the letter just referred to, observe, with respect to Bucharian rhubarb, that, "the true Bucharian rhubarb, of which we sent you samples in 1840, does not come to us by Brody, as you suggest, but by Nischny (or Nishnij), to which place it is brought in a crude state, and where it is trimmed for the Moscow market." Mr. Faber, however, assures me that he is confident that both true Bucharian, and also Siberian rhubarb under the name of Bucharian, have been brought by Brody; because one of his Vienna friends describes exactly the former, and the other exactly the latter; and both are to be depended on, and understand their business extremely well.

3. *Taschkent Rhubarb.*

By way of explanation respecting this rhubarb, it may be premised, that the rhubarb which is imported into England from St. Petersburg, and which is here commonly known as *Russian Rhubarb*, is called in Russia *Chinese Rhubarb;* while our Canton rhubarb is unknown in Russia; for it is the policy of the Russians not to admit China products by sea, as they have no sea communication with China; and consequently, rhubarb, tea, and other articles are not admitted from England.

In the letter from St. Petersburg to Mr. Faber, from which I have before made some extracts, the following observation occurs:—"The refuse of the true Russian rhubarb (here called Chinese rhubarb) comes to us by way of Taschkent, and differs very little from the crown rhubarb. It is called here *Taschkent rhubarb.*"

From this observation it is obvious that the suggestion contained in my former paper, as to the origin of Bucharian rhubarb, is not correct. Bucharian rhubarb is therefore a distinct sort, and is not the refuse of the crown rhubarb as I had supposed.

I am informed that in Russia the Bucharian and Taschkent rhubarbs are used for purposes for which the crown rhubarb is too expensive.

Chemistry of Rhubarb.—Grassman, to whose paper I have already several times referred, sent to Buchner, from St. Petersburg, four sorts of rhubarb, which were chemically examined by Dr. J. E. Herberger, some of whose results I here subjoin. I may premise, however, that the rhubarb which he calls *Chinese*, is doubtless the sort known in England as Russian. The *white rhubarb* is the kind to which I have referred in my *Elements of Materia Medica*, vol ii. p. 1179, 2d edition.

Dr. Herberger subjected the rhubarbs to the successive action of ether, alcohol, and water, so that the residue which was unacted on by ether, was subjected to the action of alcohol, and the residue from which alcohol extracted nothing more, was then submitted to the action of water.

The residue which was thus undissolved by ether, alcohol, and water, was then incinerated. The lime contained in the obtained ashes was afterwards converted into oxalate of lime by means of neutral oxalate of potash. In this way was obtained the amount of oxalate of lime mentioned in the subjoined table:

	Decigrammes [2=3.0868 grs. Troy] of the following Rhubarbs.			
	Bucharian.	Chinese. [Russian.]	White.	Siberian. Rhapontic
	Grammes.	Grammes.	Grammes	Grammes.
Dry Ethereal Extract . .	0·0005	0·0005	0·0005	0·0010
" Alcoholic do . . .	0·0030	0·0020	0·0020	0·0030
" Aqueous do . . .	0·0095	0·0100	0·0110	0·0120
Oxalate Lime	0·0035	0·0040	0·0043	0·0015
	0·0165	0·0170	0·0178	0·0175
Other constituents of the Ashes—Woody Fibre.	0·0035	0·0030	0.0022	0·0025
	0·2000	0·2000	0·2000	0·2000

The white rhubarb, it will be perceived, contains more oxalate of lime than the other sorts. This constituent, with the starch, is the cause of the whiteness of this sort of rhubarb.

It is obvious, however, that no reliance can be placed on the results, on account of the minute quantities of the substances operated on.—*Pharm. Journ.*

ART. XXV.—ON THE STATE OF PHARMACY IN POLAND.

By Franz Sokolowsky.

Although the Poles are groaning under a load of oppression, and their literature is confined to their own country, their public institutions, in general, are excellent, worthy of imitation, and in accordance with the state of civilization in Europe in general, as may be proved by inspection of the Medical regulations relating to Pharmacy in Poland.

In the year 1839, a General Direction of Medical Affairs with two sub-divisions, was instituted in Warsaw, by an order of the Emperor and King. The one division, the Medical Council, is engaged in scientific subjects, Institutions of Education, Examinations, &c.; the other relates to medical police. Under this central direction are four medical inspectoria; so that for every two governments an inspectorium exists, constituted of three Physicians, one Assessor of Pharmacy, and one Assessor of Veterinary Medicine.

The whole range of Pharmacy is under the control of this General Board of Directors.

1. *Scientific Relations.*—As a preliminary condition to being articled to a Pharmaceutist, the youth must have gone through the fourth class of a public school, and pass an examination before the medical inspectorium, to show his sufficiency in languages and natural philosophy. When he has passed this examination, he is during three or four years

apprenticed; at the termination of which period, he is admitted to the assistants' examination, which consists of compounding a few preparations in the presence of the Assessor of Pharmacy, and giving a circumstantial description of the operations; after which he is admitted to the *vivâ voce* examination, on theoretical and practical Pharmacy, Chemistry, Botany, Pharmacognosia, Zoology, Mineralogy, and Natural Philosophy. The minutes of the examination, together with the preparations he has compounden, are forwarded to the central Medical Council, which, according to the opinion of two of its members, confers on him the degree of *Assistant* of the *first* or *second class*. To obtain the degree of a *Provisor*, the assistant's degree must be of two or three years' date, and then the candidate must go through a course of scientific studies of two years' duration, either in the school of Pharmacy, at Warsaw, or at an Imperial university. The Provisor's examination is practical, as well as by written papers, and by *vivâ voce* examination. It must be passed before the Medical Council at Warsaw, and is far more difficult and more comprehensive than the assistants' examination. When the Pharmaceutist has passed this examination creditably, he is sworn in as *Pharmaceutical Provi or*, and furnished with a diploma to that effect.

Two or three years after this he may aspire to the rank of Apothecary, by passing another examination still more difficult than the former one.

The school of Pharmacy at Warsaw has three professors, and besides being of large extent, contains excellent collections and specimens, and may be reckoned among the best in Europe. The number of students amounts to about sixty. The lectures are all delivered gratis.

2. *Medico-legal Relations.*—In this respect there exist the following standing regulations:—A diploma as apothecary solely entitles a person to keep a shop. Every prescription must, on receipt, be rated and entered into a book,

and the prescription itself numbered according to the apothecaries' book *(protocol)*. On the white or red label (according as the medicine is for external or internal use) must be marked (besides the directions for use) the number in the book, the name of the patient and that of the medical man, the signature of the assistant who made up the prescription, the price, and the date. On the back of the label, a copy of the prescription, which remains in the apothecaries shop, must be written out. Every medicine is to be sent out sealed. Every shop is visited once a year by the Director General himself, or an inspector, aided by the Assessor of Pharmacy. The books of business, which are on these occasions rigidly inspected, are—1, the protocol, or prescription-book; 2, the book of sale over the counter; 3, the laboratory ledger; 4, the stock-book; 5, the poison-book; 6, the journal of correspondence with medical or other authorities. The central council publishes every year a list of all Physicians and Apothecaries in the kingdom, and a list of prices according to the fluctuations of the market, calculated by the medical authorities. Every Apothecary is regarded and treated as a servant of the state, and every shop as a government institution. After a series of years, the Apothecary is pensioned as a servant of the state, or in case of offence punished as such. Every Apothecary is exempt from billet or taxation. Every Pharmaceutist, from the apprentice upwards, is exempt from military service. Christians are alone permitted to enter on a Pharmaceutical apprenticeship. The number of Apothecaries is strictly regulated in accordance with the population, so that the establishment of a new shop is only allowed in extraordinary cases, and then merely when the authorities of that district, and all Apothecaries within twenty-four miles of that place, consider the institution of a new shop imperatively necessary.

The supply of crude materials the Apothecary may draw from the country or from abroad, but all preparations he

must compound himself. Consequently there exists no manufactory of medicinal preparations in the kingdom of Poland.

From this report, it is clear that the medical regulations in the kingdom of Poland are efficient, and that the Apothecary in general stands on a high scientific and professional footing, enjoys great protection from the government, and that the medical police regulations are strictly enforced for the benefit of the public in general.—*Pharm. Journ. from Correspondenz-Blatt für Süd-Deutschland.*

ART XXVI.—ON THE PRODUCTION OF VALERIANIC ACID AND A NEW SUBSTANCE FROM CASEINE.

By Justus Liebig.

When cheese prepared from fresh or sour milk, and which has been well pressed and freed as much as possible from adherent butter, is kept with an equal weight of hydrate of potash (or solution of potash, which would crystallize on cooling) in a state of fusion until hydrogen gas is evolved along with ammonia from the fusing mass, and the residue is then dissolved in hot water, slightly supersaturated with acetic acid, and the filtered solution allowed to cool, a quantity of very minute needles separate, which are very sparingly soluble in cold water and insoluble in alcohol and æther. By repeated solution in water to which some carbonate of potash is added, and precipitated with acetic acid, this body is obtained in perfectly white silky needles. From a preliminary analysis, which requires confirmation, its composition is expressed by the formula $C^{16}NH^{9}O^{5}$. Although readily soluble in alkalies, it combines

with acids. The mother-ley from which this body crystallizes yields, on further evaporation, a considerable quantity of leucine. When the fused mass is supersaturated with tartaric acid instead of acetic acid and the liquid submitted to distillation, an acid product is obtained, which on saturation with barytic water, evaporation to dryness, and submitting the dry barytic salt with phosphoric acid to distillation, yields a colourless oily acid and an aqueous oily fluid possessing the odour and all the properties of valerianic acid. Leucine yields, on fusion with hydrate of potash, ammonia and hydrogen; the residue contains valerianate of potash; the formation, therefore, of the leucine appears to precede that of the valerianic acid when caseine is fused with potash. To within 1 equivalent of hydrogen the formula for leucine expresses the composition of an æther consisting of 1 atom cyanic acid, 1 atom oxide of amyle and 2 atoms water. By passing the vapour of the hydrate of cyanic acid into anhydrous fusel oil, a solid crystalline substance, soluble in water, is obtained, which readily crystallizes from this solvent, and in external appearance has the most striking resemblance to leucine, from which, however, it differs by its solubility in æther.

When the fusion is continued for a longer time, a considerable quantity of butyric acid is obtained along with the valerianic acid. The silver salt, prepared with the oily valerianic acid from caseine, left on combustion 51·62 silver so that its identity with the ordinary valerianic acid cannot be doubted. The crude distillate contains, besides valerianic acid, a volatile substance of the odour of human fæces, which reduced the nitrate of silver, but contained no formic acid; a quantity of the oxalate of potash separated from the alkaline ley previous to its being supersaturated with tartaric acid.

I have not observed in the treatment of caseine with potash, any protide and erythroprotide, names given by Mulder to two smeary syrupy bodies, which he obtained in

the action of potash upon albumen; nor do I believe that he or any other chemist has ever again obtained them of the same composition as he ascribes to them; for they are nothing more than a mixture of intermediate products, which vary according to the temperature, the duration of the action, and the concentration of the alkali.—*Chem. Gaz., from Liebig's Annalen, Jan.* 1846.

ART. XXVII.—ON GUTTA PERCHA, A PECULIAR VARIETY OF CAOUTCHOUC.

By Douglass Maclagan, M. D., F. R. S. E.

Gutta Percha is the Malayan name for a substance which is the concrete juice of a large forest tree native of the shores of the straits of Malacca, Borneo and the adjacent countries. The tree yielding it is unknown botanically, all the information we possess regarding it being that it is a large forest tree, and yields this product abundantly. We are indebted for our knowledge of it to Dr. W. Montgomerie, H. E. I. C. S., whose spirited exertions to improve the cultivation of colonial produce at Singapore have obtained for him several distinguished marks of approbation from the Royal Society of Arts of London. For his communication regarding gutta percha, Dr. Montgomerie received a silver medal from the Society.

This substance in its crude state differs in many particulars from common caoutchouc; it is of a pale yellowish, or rather dirty white colour; it is nearly as hard as wood, though it readily receives the impression of the nail. It is very tenacious, and not at all elastic.

It seemed to me to be worth while to determine whether or not this substance really was a variety of caoutchouc, and for this purpose I subjected it to the ordinary process of ultimate analysis, and obtained as its per-centage composition,—carbon, 86·36; hydrogen, 12·15; the remainder, 1·49, was most probably oxygen absorbed from the air during the process employed for purifying it, as the substance, whilst heating on the vapor-bath, acquired a brown colour. The only analysis of common caoutchouc with which I am acquainted is that of Faraday, who obtained, carbon, 87·2; hydrogen, 12·8. The results are sufficiently near to warrant the conclusion, that the two matters in question are generically the same.

I found also that the gutta percha yields the same product of destructive distillation as the common caoutchouc. Without enteriug into details, I may briefly state, that both equally yield a clear yellow limpid oil, having no fixed boiling-point, and therefore being a mixture of different oleaginous principles. In both instances the distillation proceeds most freely at temperatures between 360° and 390° F., and seems almost stationary at 385°. Comparative analysis of several portions of the two oils were made, and, as is already known of common caoutchouc, the products exhibit a constitution represented by the formula $C^{10} H^8$. The gutta percha thus appears really to be a modification of caoutchouc.

In its general properties it likewise shows a similarity to common caoutchouc. It is soluble in coal naphtha, in caoutchouc oil, and in æther. It is insoluble in alcohol and in water, and floats upon the latter.

Its most remarkable and distinctive peculiarity is the effect of heat upon it. When placed in water at 110°, no effect is produced upon it, except that it receives the impression of the nail more readily; but when the temperature is raised to 145° or upwards, it gradually becomes so soft and pliant as to be capable of being moulded into any form, or

of being rolled out in long pieces or flat plates. When in the soft state, it possesses all the elasticity of common India rubber, but it does not retain these properties long; it soon begins again to grow hard, and in a short time, varying according to the temperature and the size of the piece operated on, regains its original hardness and rigidity. A ball 1 inch in diameter was completely softened by boiling water in 10 minutes, and regained its hardness completely in less than half an hour. It appears to be capable of undergoing this alternate softening and hardening any number of times without change of property.

It is also to a certain extent ductile. When soft it is easily torn across, but when hard it is very tenacious. A piece not an eighth of an inch in thickness, when cold, easily raised a weight of 42 lbs., and only broke when half a hundred weight was attached to it.

From these properties, it seems capable of many applications in the arts. Its solution appears to be as well adapted as that of common caoutchouc for making water-proof cloth; and, whilst softened, it can be made into solid articles, such as knife-handles, door-handles, &c. Malays employ it for the former of these, and prefer it to wood. A surgeon furnished with a small piece, could easily, with the aid of a little hot water, supply himself with bougies or pessaries of any size or form.—*Chem. Gaz. from Edinburgh Philosophical Journal.*

ART. XXVIII.—ON THE MEDICAL AND ECONOMICAL PROPERTIES OF THE ANACARDIUM OCCIDENTALE, OR CASHEW-NUT TREE.

By W. Hamilton, M. B.

The cashew-nut tree, or Anacardium occidentale, must not be confounded, from the resemblance it bears to the vulgar name of common cashaws, with trees of a widely different character belonging to the genus Acacia, of which I may perhaps have occasion hereafter to take some notice.

The Anacardium occidentale is known in various parts of the West Indies by a considerable diversity of names, of which the most frequent are, *Acajou* and *Pommier d'Acajou* in the French, and cashew apple (evidently a corruption of the French,) and cherry-tree, in the English islands. It is a handsome spreading tree of about twenty feet in height, of quick growth, coming into bearing in the second year from the time of sowing the seed, and continuing to bear fruit for fifty, or even, in some instances, one hundred years. Its timber is hard, close grained, and durable, applicable to many useful purposes. Its trunk and branches yield, on being wounded, during the monthly ascent of the sap, a white and transparent gum, similar in appearance to that of the Acacia vera, or gum arabic. Of this gum, which is subastringent, and furnishes a good substitute for gum arabic, a full grown tree will yield an annual amount of ten or twelve pounds. This gum, being unpalatable to insects, is particularly adapted for use where their depredations require to be guarded against. By tapping the trunk, a milky juice is obtained which stains linen of a durable black, and might serve as a marking ink. Three varieties occur, one with red, another with yellow fruit, and a third with fruit streaked with red and yellow.

That these are mere varieties appears from the statement of Mr. A. Robinson, of Jamaica, who informs us, that the nuts of the red variety, when planted, will produce trees bearing yellow fruit; and those from the yellow variety, trees bearing red fruit.

The fruit, termed by the English planters the cashew apple or cherry, is merely an enlarged succulent peduncle, or receptacle, of a pear shape, and bearing at its extremity a reniform nut, adhering to it by the centre of its convex surface. The former is the apple, the latter the cashew-nut, a luxury not unknown at our own tables. The kernel of this nut is enclosed in a hard shell, covered by a thinner membraneous envelope; and between these resides a thick blackish oil, of such causticity as to blister the lips of those who incautiously suffer it to approach them; on this account these nuts are never eaten till after they have been well roasted to dissipate the oil. After this they may be taken with impunity, and ground up with cocoa, as Lunan states (*Hort. Jam.* i. p. 159,) they make an excellent chocolate. Whether Lunan here means the nut of the Cocos nucifera, or of the Theobroma cacao, also called *cocoa*, in vulgar parlance, does not clearly appear.

The caustic oil, of which mention has been made, is useful as an external application, for the removal of freckles and corns, and the cure of malignant ulcers, when diluted with a sufficient proportion of some bland oil; smeared on wood it preserves it from decay, and from the depredations of insects.

The succulent peduncle, which is about the size of a large fig, is an agreeable subastringent fruit, of considerable efficacy as a tonic and diuretic; and Dr. Barham informs us, "that poor dropsical slaves that have had the liberty to go into a cashew-nut walk and eat what cashews they pleased, have recovered." He also states, that "having a large orchard of about three hundred trees, after the market was glutted with them, he distilled a spirit from

them far exceeding arrack, rum, or brandy, of which they made an admirable punch that would provoke urine plentifully." Dancer, in his *Medical Assistant*, states, that "the expressed juice of the fruit in red wine sangaree, is good in female weaknesses," and is effectual as a diuretic in dropsies; adding that, "the Portuguese turn their dirt eating negroes out in the cashew season, and *force* them to eat the fruit."

The fruit roasted when ripe and added in slices to punch communicates an agreeable flavour to it; and if the punch thus prepared be bottled, it soon ferments and becomes a delicious sparkling liquor. Advantage has been taken of this readiness to run into the vinous fermentation, to manufacture an excellent wine from this fruit. The earliest notice I can find of this fact is the following, contained in Lemery's *Dictionnaire des Drogues*, where he says, under the head of "Pomme d'Acajou, cette pomme est d'un jaune rougeâtre, couverte d'une peau mince et tendre, sa chair est spongieuse, empreinte au commencement d'un suc lacteux, acide et astringent; mais sa couleur et le goût de suc se détruisent à mesure qu'il fermente, et il devient vineux, en sorte qu'il enyvre ceux qui en boivent beaucoup." Lunan also observes, in his *Hortus Jamaicensis*, p. 159, published in 1814, that "this juice expressed and fermented makes a fine rough wine, useful where the viscera or solid system has been relaxed." Indeed, the wine so prepared, as I can state from my own personal observation, possesses all the astringency and tonic properties of port wine, and might be made a valuable staple of exportation from our colonies.

But the first individual who can claim the merit of having made this fruit the subject of scientific experiment, was, I believe, my amiable and philanthropic friend, James Webbe Tobin, Esq., of the island of Nevis, whose active and vigorous mind, notwithstanding the disadvantage under which he laboured, of loss of sight, was incessantly

occupied with schemes of general utility, calculated to promote the comforts or add to the happiness of his fellow-creatures.

After a number of experiments, attended with a considerable diversity of success, he at last produced a very palatable wine; and, had it pleased Heaven to have spared his valuable life a few years longer to his young family and his fellow-creatures, there can be little doubt that he would have carried the manufacture of this excellent wine to a still higher degree of perfection.

The following is the process which he found to answer best, and which he commnnicated to me a short time before the premature termination of his valuable life in 1814:

"Mix two parts of the expressed juice of the fruit with one part of water; putting to every gallon of juice three and a half pounds of the best sugar, and to every gallon of water four pounds; and adding six gills of lime juice for every eight pounds of sugar. Bung the cask down tight before the fermentation has wholly subsided, and fine in the usual way with eggs."

As standing long upon the lees is apt to communicate a disagreeable bitter taste to the wine, not afterwards to be got rid of, it might be an improvement upon Mr. Tobin's plan, to rack it off into a clean cask before the fermentation has wholly subsided, and then to bung the cask tight down; and a further improvement might be perhaps effected by adding some of the extract of the Krameria triandra, which grows in South America, and is employed by the wine merchants in Oporto to improve the quality and heighten the colour of their port wines. A species of the same genus also, the Krameria ixina, grows in Hayti and St. Kitts, the roots of which, no doubt, possess properties similar to those of the species found upon the Spanish main, the medicinal properties of which were so highly eulogized by the late Dr. Rees, under the name of *Rhatany Extract*. The Krameria ixina, whose existence in St. Kitts has escaped the notice of

Swartz, or any other botanist whose works I have met with, was found by me growing on Guinea Corn Hill, at the south-eastern end of the plain of Bassetere, where no doubt it may still be found. In Hayti I met it growing along the foot-path to the deserted plantation Destin, or Tittine, as it is commonly called; the same spot in which I afterwards found it had been previously discovered by the Chevalier Tussax, who has accurately described and figured it in his magnificent "*Flore d'Antilles.*"

In making the cashew wine no addition of yeast is required to make the fermentation commence. When new the wine is agreeably sweet and pleasant; but by age it acquires the roughness and much of the flavour of port, a resemblance which would be greatly increased by the addition of the extract obtained from the krameria.

The subjoined table, which I have calculated from Mr. Tobin's directions, exhibits the relative quantities of water, sugar, and lime juice, for various quantities of cashew juice, and may facilitate future experiments.

Cashew Juice.	Water.		Sugar.		Lime Juice.		
Galls.	Galls.	Qts.	lbs.	oz.	Galls.	Pints.	Gills.
2	1	—	11	—	—	2	½
4	2	—	22	—	—	4	1
5	2	2	27	8	—	5	1¼
8	4	—	44	—	1	—	1
10	5	—	55	—	1	2	1½
12	6	—	66	—	1	4	1¾
14	7	—	77	—	1	6	2
15	7	2	82	8	1	7	2¼
20	10	—	110	—	2	4	2½
25	12	2	137	8	3	1	3¼
50	25	—	275	—	6	3	2½
60	30	—	330	—	7	5	3½
70	35	—	385	—	9	—	¾
80	40	—	440	—	10	2	2
100	50	—	550	—	12	7	½

By bottling it before the fermentation has wholly subsided, a pleasant sparkling wine may be obtained, more agreeable even than champagne.

In one instance, in which a quantity of this wine was made by a friend, according to Mr. Tobin's receipt, the process appeared to have failed, and the produce was bottled off, under the impression that it might be converted into good vinegar; but, on opening one of the bottles many months after, when some vinegar was required, my friend was agreeably surprised to find, on drawing the cork, that in place of vinegar, he had a bottle of most delicious sparkling wine. In fact, it had been bottled somewhat too soon, while the process of fermentation was still going on, although in a reduced degree, and thus the escape of the carbonic acid, which continued to be generated, was prevented. How long the wine, bottled in this state of fermentation, could be kept without running to the acetous fermentation, remains to be determined by experiment.

The cashew-tree being easily raised from seed, coming into bearing within twenty-five months from the time of sowing, bearing its fruit in profusion, and continuing to bear abundantly for a long succession of years, there can be little doubt, that if a market could be found for its products, its cultivation would soon attract a degree of attention not hitherto accorded to it. These products are, 1. The gum which exudes from the wounded bark, of which between 3 and 4000 pounds might be annually obtained from a plantation of only 300 trees. This gum, from its subastringency, possesses many advantages over that of the Acacia vera, for a variety of purposes, those especially, in which it is desirable to guard against the depredations of insects, to whom this astringency is repulsive. 2. The leaves, which in decoction, form a good lotion for bad ulcers. 3. The milky juice, which is obtained by tapping the trunk, and which, as Long suggests, might probably be converted, by evaporation, into a valuable varnish. 4. The caustic oil obtainable from the nuts, which is so valuable as a preservative of timber from the assaults of insects, and probably also from the growth of those fungi which occasion

what is commonly called *dry rot*, and when mixed with tar, would, in all likelihood, be found useful for covering the bottoms of ships. As an escharotic, it forms, when carefully applied, a good remedy for the removal of callosities, such as warts and corns; and as a stimulant application, may be employed to restore a healthy action in cases of herpes, ill conditioned ulcers, &c., being first diluted to the proper degree with some mild oil. Similarly diluted, but to a still greater extent, it becomes a safe and certain cosmetic, by exciting an inflammatory action, which produces desquamation of the cuticle. Two young women of colour in Nevis, anxious to improve their complexion, employed this oil without due caution, and excited a degree of inflammation so violent, as to cause intense suffering, and endanger their lives; by careful and judicious treatment however, the inflammatory action was conducted, at the end of about five or six weeks, to a happy termination, and the vanity of the young ladies amply gratified by the brilliancy, clearness, and beauty of their new complexion. Whether they had occasion, or felt an inclination to repeat the experiment, I was not fortunate enough to learn. 5. The spirituous liquor which may be obtained by distillation from the fruit, and which, according to Dr. Barham, possesses the same diuretic properties as the best Hollands; and 6. The wine prepared from the fermented juice expressed from the fruit, and which, if improved by the addition of a due proportion of the extract of the roots, either of the Krameria triandra, which is found on the Spanish main, or the Krameria ixina (which I found near the ridge of Guinea Corn Hill, to the east of the ponds of Basseterre, and may exist in other parts of the island which I had not an opportunity of examining,) and kept in bottle for some years, would equal in flavour the best port of Oporto, and not improbably combine, with the tonic and astringent properties of the Portuguese wine—properties to be chiefly ascribed to the krameria extract, or "wine colouring," added to

by the merchants—those diuretic properties which so strongly characterize the fruit of the anacardium in its recent state. To these products may be added a 7th, the nuts, which, after the separation of the caustic oil, would be found desirable additions to an English dessert. And, 8th, the timber of the trees, after they have ceased to bear, and which, from its strength and durability, is extremely valuable.

Hence it is perhaps questionable, whether an acre of land planted with cashew trees (which demand little of human labour, and that of the least exhausting kind, and are not exposed to the innumerable casualties of the cane,) would not be found to yield a net produce, upon an average of years, superior to that of sugar—especially as land no longer suitable for the cane, might be still rendered productive as a cashew orchard.—*Pharm. Jour.*

ART. XXIX.—ON THE TEMPERATURE OF THE WATER USED IN THE PREPARATION OF INFUSIONS.

By Mr. Thomas Greenish.

The most desirable temperature for the water used in the preparation of some of the infusions of the Pharmacopœia, having been casually discussed on several occasions at our evening meetings, and my experience inducing me to differ from the opinions then expressed, it occurred to me that a few remarks on the subject might be productive of some benefit, more especially as it has again been adverted to in a paper read at the October Meeting, on the subject of a National Pharmacopœia. It is unnecessary before this

Society to dwell on the importance of these preparations, the attention which has been already bestowed upon them is a sufficient evidence that they are by no means disregarded.

I shall confine myself on this occasion to the consideration of the methods which have been recommended for the preparation of infusion of calumba. This infusion is in frequent use, and is one of those most difficult to preserve from undergoing decomposition. Many Pharmaceutists recommend that the water for the preparation of this infusion should be either cold, or considerably under the boiling temperature, and the cold infusion, by percolation has received the sanction of the Edinburgh College. I shall therefore endeavour, as briefly as possible, to state the result of some experiments I have made with reference to this infusion.

An infusion of calumba made with cold water, after being allowed to stand the specified time, which is two hours, and then strained off, will be very bright and free from starch; whilst on the other hand, if made with boiling water, it will contain a considerable quantity of starch, and will not be quite so bright. The latter difference is caused by very fine particles held in suspension, which gradually subside; the difference between the two in strength and aroma appears quite trifling and unimportant.

If portions of the two infusions be kept under similar circumstances, that made with cold water will be observed to be several hours in advance of the other in the commencement and progress of decomposition; and if it be warm summer weather, symptoms of incipient change will very rapidly appear, being indicated by a general cloudiness, and the accumulation of small particles of insoluble matter on the surface of the hitherto bright infusion, which gradually extend themselves throughout the entire fluid. The precise time at which this takes place, will of course depend much on the state of the weather. The change, when it becomes visible, in the infusion made with boiling

water, does not proceed so rapidly as in the one made with cold water, and if the infusion be examined from time to time during the progress of the decomposition, the large quantity of starch which it originally contained, will be found to be gradually disappearing, and ultimately a solution of iodine will not detect its presence—it will have totally disappeared.

Now the two substances which appear to be principally concerned in these changes, are, vegetable albumen and starch; and these bodies are known to be present in considerable quantity in calumba root.

Albumen, when in solution, is especially characterized by great instability, mere contact with atmospheric air being sufficient to induce rapid decomposition. Starch, on the other hand, is a much more stable body, and the changes which it undergoes are generally induced by the presence of some albuminous matter acting as a ferment.

When the infusion is made with cold water, the albumen is dissolved out from the root unaltered, and the presence of this body soon gives rise to decompositions which render the infusion unfit for use.

If the infusion be made with boiling water, the albumen will be partially coagulated, rendered less soluble, and not so liable to undergo decomposition. Nevertheless, it is probable that a portion of albuminous matter taken up, even in this case, by the water, is the cause of the subsequent change which is found to take place in the starch. Thus I find that if an infusion, whe her made with cold or with boiling water, be subsequently heated to the boiling point, it will keep for a much longer time, without undergoing decomposition, than it otherwise would; and this seems to indicate the necessity of scalding out the infusion jug before making this infusion, so that the temperature of the water should be as near the boiling point as possible.

There are no doubt some cases in which it may be desirable to avoid the presence of starch in preparations of this kind, and this can only be effected by the use of cold or

tepid water; but the increased tendency of infusion of calumba, when thus prepared, to undergo decomposition, shows, I think, that there are serious objections to the general adoption of that mode of making infusions.—*Ibid.*

MINUTES OF THE PHILADELPHIA COLLEGE OF PHARMACY.

A stated meeting of the Philadelphia College of Pharmacy, was held Ninth month 29th, 1845.

Charles Ellis, first Vice President in the Chair.

The Committee appointed at the last stated meeting, on the financial condition of the College, &c., reported progress, but are not prepared to make a final report. They are continued, to complete the object of their appointment.

The Committee appointed to publish a new edition of Latin Labels, reported that they had completed the publication, and are continued to make a statement of the expenses incurred.

The proposition to alter the By-Laws, submitted at last meeting, now claiming attention, it was on motion resolved, that law 7th, section 1st, shall read as follows:

"The stated meeting of the College for the transaction of business, shall be held on the last Monday of March and of September."

On motion, a Committee of three was appointed to assist the Secretary to revise and publish the Rules, Regulations and By-Laws of the College, with a list of the members.

A specimen of Blue Mass, manufactured by George W. Ridgway, was submitted for examination.

The following members were elected Trustees for one year, viz:

Thomas P. James,	Jacob L. Smith,
Dr. Robt. Bridges,	Henry W. Worthington,
A. J. Duhamel,	Ambrose Smith,
Jas. L. Elliott,	Robt. Shoemaker.

Then adjourned.

A stated meeting was held Third month 30th, 1846.—Present 22 members.

Daniel B. Smith, President, in the Chair.

The minutes of the Board of Trustees were read and adopted.

Since the last meeting of the College, the following gentlemen have been elected members of the College by the Board, viz: William Ellis, Samuel P. Thompson, Peter Babb, Benjamin J. Ritter, Wm. H. Needles, Robert C. Brodie, Daniel S. Jones, John Reakirt, Samuel N. James, Henry W. Gillingham, J. R. Taylor, J. P. Wilson Neill, Wm. J. Jenks, and Alexander F. Hazard. The Board also recommended to the College the names of John C. Baker, Wallace Marshall, Henry H. Kelley, Daniel L. Miller, Jr., James N. Marks, and Ellwood Wilson, M. D., who being separately ballotted for, received the requisite number of votes, and were declared duly elected resident members.

The Committee on Finance, reported progress but were not yet prepared to make a final report, and are continued for that purpose.

On motion, it was resolved, That the Publishing Committee be authorized to pay over to the Finance Committee such sum as they may be able to spare from the funds of the Journal of Pharmacy. Also, Resolved, that the Committee of this College on Latin Labels and Patent Medicine Directions, are both hereby authorized to pay over to the Finance Committee, any moneys which may be in their

hands, or which may hereafter accrue as profits from said publications, and that the said Finance Committee are directed to apply such amounts as they may receive, to the liquidation of the stock debt of this Institution.

It was further Resolved, That the Professors be required to pay into the hands of the Treasurer 12½ per cent of the nett proceeds of all the money received from the sale of tickets to the Lectures, in addition to the Matriculating fee—the arrangement to continue for three years.

The following resolution offered by the Finance Committee was on motion adopted.

The following named members of the Philadelphia College of Pharmacy, having relinquished to the College one share of its Loan, amounting to $100 each, provided they are exempted from further contribution; therefore, Resolved, That Samuel F. Troth, Thomas Oliver, Jacob Bigonet, George D. Wetherill, Joseph C. Turnpenny, and John Goodyear, be exempted from further contributions to this Institution.

The Committee on Latin Labels were not yet prepared with a statement of their accounts, and are continued to make a written report to the next meeting.

The Committee appointed in conjunction with the Secretary, to revise and publish the rules and Regulations of the College, with the By-Laws, list of members, &c., reported that they had attended to the subject, and that a copy was prepared for publication. They are continued to complete the service.

A report from the Publishing Committee was read and adopted, by which it appears that they have entered on the publication of the 18th volume of the Journal, and a lively interest continues to be manifested in this interesting periodical by the members of the profession in this and other States. There are some outstanding debts yet to be collected, and a small capital of about 200 dollars has accumulated in favor of the Publishing Committee.

A memorial was read, signed by Wm. Procter, Jr., A. J. Duhamel, and Edward Parrish, accompanied by the following resolution:

Resolved, That a committe of nine members be appointed to take into consideration the propriety of creating a new professorship, the occupant of which shall be called "The Professor of Theoretical and Practical Pharmacy"—and if they deem it expedient, to mature a plan for the consideration of a future meeting.

After an animated discussion, the resolution was adopted, and the President appointed the committee.

It was Resolved, That a Committee of two members be appointed to assist the Treasurer in collecting the arrearages due the College. Samuel F. Troth and Edward Parrish, were appointed by the Chair.

The following proposition was submitted by the movers, and is laid on the table for consideration at the next stated meeting:

We propose to the Philadelphia College of Pharmacy that law 5, section 1st, be amended by striking out the following words:

"The number of resident members shall not exceed 100."

SAMUEL F. TROTH,
JOSEPH C. TURNPENNY.

This being the usual time for the annual election, it was moved to proceed therein, and the following members having received a majority of votes for the offices attached to their names were declared duly elected.

President,
DANIEL B. SMITH.

1st. Vice President,
CHARLES ELLIS

2d. Vice President,
SAMUEL F. TROTH.

Treasurer,
JOSEPH C. TURNPENNY.

Secretary,
DILLWYN PARRISH.

Corresponding Secretary,
WILLIAM HODGSON, JR.

Trustees,

JOHN H. ECKY, EDWARD PARRISH,
JOSEPH CARSON, M. D., JOHN HARRIS,
WILLIAM PROCTER, JR. ALBERT L. LETCHWORTH,
WARDER MORRIS, WILLIAM P. TROTH.

Publishing Committee,

DR. ROBERT BRIDGES, A. J. DUHAMEL,
WILLIAM PROCTER, JR., CHARLES ELLIS,
AMBROSE SMITH.

A special meeting of the College was held Fifth month 4th, 1846.—Present 18 members.

DANIEL B. SMITH, President, in the Chair.

The President announced that the meeting had been called to receive the report of the Committee of Nine, appointed to consider the propriety of creating a Professorship of Pharmacy. The following report was then read and considered, and unanimously adopted:

To the Philadelphia College of Pharmacy.

The Committee to whom was submitted the proposition made at the last meeting of the College, for the establishment of a professorship of Pharmacy, having deliberately considered the subject, have agreed upon the following report.

The original objects contemplated in the establishment of the College, appear to have been various. The protection of the drug market from adulterated and spurious articles; the discouragement of quackery and deception in drugs; the collection of a scientific library for the use of

druggists and apothecaries; and the adoption and publication of approved formulæ, appear to have been prominent features in the plan of its founders; yet it will be seen by reference to the minutes that the establishment of a School of Pharmacy was early an object of paramount concern with the members of the College, and has always been regarded as the chief means of correcting the abuses which had obtained in the profession, and of placing it on the respectable footing it ought to possess as a branch of the science of medicine.

In organizing the School of Pharmacy, it was found necessary to seek professors in the ranks of the medical profession—few, if any, of the Apothecaries had so accustomed themselves to the systematic study of the several branches connected with the practice of our profession, as to be prepared to assume the office of teachers. Hence it is not surprising that the theory and practice of Pharmacy, although held to be of the highest importance to the student, was not allotted to a professor as a separate branch of instruction, but was appended secondarily to the branches of materia medica and chemistry. The question now arises whether, by the lectures in our school, and by other means tending to create a greater taste for scientific attainment among those who practice our profession, so much advancement has been made, as to warrant the appointment of a practical Apothecary to teach, in a scientific manner, what has hitherto, in America and England, been the confused and unsystematized art of Pharmacy. This is the question which the College is now called upon to decide. It is obvious that an imperative demand exists, either for some change in the organization of the School of Pharmacy, by which our graduates may be instructed in this branch, or for additional regulations limiting or altering the terms of graduation, so as to deprive of the degree that class of students, who, from the circumstances in which they are placed, and from no fault of their own, cannot become fully quali-

fied for the practice of Pharmacy. This class of students, it is believed, constitute the larger portion of those attending the lectures. All apprentices engaged in wholesale stores are included in it, besides many who are brought up in *retail* establishments. When we consider that apothecaries, as at present existing, are men of every degree of attainment, from the mere pretender, to the accomplished Pharmaceutist, some of them owing their instruction to a brief term of apprenticeship in which their opportunities were extremely limited, and many of them following the business with a stock of knowledge altogether inadequate to its proper prosecution, we can be at no loss to account for the fact so often apparent to those who have served on the Examining Committee, that students coming from such preceptors frequently manifest gross ignorance in regard to Pharmacy, though by the Lectures in the School they may have acquired a considerable knowledge of Materia Medica and general Chemistry.

That Pharmacy is a branch of knowledge distinct from Chemistry and Materia Medica, no one will deny, and that its teacher should be practically familiar with its rules, and operations is equally evident. The time devoted by the Professor of Materia Medica to teaching his branch is hardly sufficient for him to do full justice to it if kept within its legitimate bounds, and if he attempt an extended view of Pharmacy, it must evidently be at the expense of his own important subject. Hence we find that Pharmacy, as at present taught by the Professor of Materia Medica, is limited to a cursory notice of the more prominent preparations of drugs, introduced as occasion offers in the course of his lectures. To any one at all acquainted with the extensive duties that appertain to the chair of Chemistry, it will be obvious that the time devoted to them is sufficiently brief, without the frequent digressions now required in illustrating the Pharmaceutical preparations.

Your Committee believe, if a course of lectures on Phar-

macy were added to those already delivered, in which the most recent and approved methods of manipulation were taught, and the best kinds of apparatus exhibited; and if these were followed by a thorough and detailed application of them in the preparation of medicines, in many instances repeating the operations before the class, and in all cases exhibiting the preparation in its most perfect condition, that the student would be able to correct the knowledge derived at home, and the Pharmacy of the city, so far as the graduates of our school are concerned, would be rendered more perfect and homogeneous in its character than at present.

Those who have not given attention to this subject, may be disposed to inquire what topics would be presented in a course on Pharmacy: we will therefore attempt a sketch of the subject coming under that head.

It is the province of the Professor of Chemistry to explain the theory of Caloric and the laws which govern its influence on matter in the abstract; it would be the duty of a teacher of Pharmacy to show *when* its influence is required in acting on matter destined for medicinal use, *how* it is best applied in effecting the modifications desired, and *what* the means and instruments are by which its power is controlled and directed to the end in view. In accomplishing this task, he would treat of the action of liquids on solids, when assisted by different degrees of heat, as in preparing infusions, decoctions, &c.; of the distillation of fluids, and the necessary apparatus required in its performance, explaining in his progress the precautions requisite to insure success. The important operation of concentration by evaporation, would require his attention to the various means of evaporating by steam, water and sand baths, as well in vacuo as in the open air; and its applications in the preparation of vegetable extracts, in the crystallization of saline solutions, &c., would be numerous and important. Again, he would have to illustrate the furnace operations called for in Pharmacy, in which the processes of roasting,

calcination, ignition, fusion, reduction, carbonization, incineration, &c., are conducted. On the theory of the formation of crystals and their geometrical relations, he would have little to say, but the means of controlling the cooling of saturated solutions of crystallizable matter, of gradual evaporation, and the shape and position of the vessels in obtaining good crystallizations, he would probably fully explain.

The division of drugs by bruising, grinding, rasping, &c., as preliminary to the important operation of pulverization, which latter in all its phases, together with the mortars, mills, sieves and other instruments which are employed in accomplishing it, and the various precautions necessary in effecting the proper division of drugs, would be expatiated upon and applied.

The means of extracting the activity of substances by maceration and displacement, as in the preparation of extracts, tinctures, wines, syrups, &c., would, we doubt not, receive a large share of attention, inasmuch as these classes of preparations embrace very many of the most important medicinal agents.

After giving a thorough examination to all the elementary operations of a Pharmaceutical Laboratory, the officinal preparations of the Pharmacopœia in classes, would afford a wide field for illustration, in which the knowledge communicated in the previous lectures could be profitably applied. Extemporaneous Pharmacy, or the knowledge required in compounding prescriptions, is so various in its character, is effected by so many unforseen circumstances, and requires such constant presence of mind in its application, that it can only be properly acquired by long practice in the shop; yet by a judicious selection of difficult prescriptions, and of cases where, from professional ignorance or carelessness, it becomes the duty of the Apothecary, either to pause until an explanation has been had of the Physician, or to assume the responsibility of a change in the

prescription when the error is obvious and life is concerned; the teacher of Pharmacy might do essential service to many of the students by giving general currency to a system of precautions now mostly confined to the establishments of the more enlightened apothecaries. In the practice of extemporaneous Pharmacy, perhaps no kind of information is more requisite than a knowledge of nomenclature, both recognised and obsolete. The medical corps, in a large city, is composed of individuals of various ages and from different countries, whose alma mater, scattered over Europe and America, recognise standards of unlike nomenclature, and the dates of whose accession to the profession range through a period of half a century. The ideas of nomenclature imbibed during the term of their collegiate studies are generally the most lasting, and hence it is that in this age of scientific exactness, we find occasionally prescriptions written as in the days of Stahl and Glauber, calling to mind the reign of Phlogiston. The periodical variations in our own Pharmacopœia, and in those of Great Britain frequently perplex the Apothecary, and demand an extensive acquaintance with the subject. We therefore infer, that a professor of Pharmacy would see the importance of instructing the students upon this branch, so as thoroughly to arm them against difficulties to which they must be liable in the practice of their profession. A knowledge of Toxicology is generally considered of great importance to the Apothecary, and no one will deny its occasional utility. The Professors of Materia Medica and Chemistry dwell on this subject, so far as it relates to the vegetable and mineral poisons occurring in their respective courses. It would be an appropriate subject for a few lectures from the proposed Professor of Pharmacy, in which a lucid and systematic review of the more prominent poisons and their antidotes, with instructions relative to the preparation and administration of the latter, and the proper precautions to be observed in vending the former, would be found ex-

tensively useful to the student, as we believe there are few subjects of like importance upon which our graduates are at present so deficient. From what has been said, it will be apparent that the Professor of Pharmacy, if one should be elected, must enter a field of labor scarcely less extensive than that of either of his colleagues in the school, and one which he will have to traverse in the double capacity of teacher and learner. We look in vain amongst the medical literature of the English language for a single work devoted exclusively and systematically to this branch of knowledge. To French and German Pharmaciens and books we are indebted for most that is interesting, instructive and original in regard to Pharmacy. The latter are only available to a limited extent in this country, and are not well adapted to our different circumstances.

We would suggest, that as Philadelphia was the first city in the Union to organise a College of Pharmacy, and has continued to be regarded as the metropolis of Pharmaceutical as well as Medical Science in America, it is peculiarly appropriate that this measure, so imperatively demanded by our present circumstances, and so necessary to an advancement of our profession, corresponding with the progress of science and general intelligence in our country, should be consummated here.

It would probably be the means of adding to the class a large number of students from a distance, and of diffusing a knowledge of correct principles, and uniform practice among Apothecaries throughout the country, which would be a source of increased revenue to the College, and of commendable satisfaction to its members.

With reference to the time of delivering the proposed course of lectures, no difficulty is presented as at first may appear. By each professor giving two lectures a week, instead of three as at present, and by continuing the course six weeks longer, commencing about the second week in October, and ending in the fourth week of March, the whole ground could be traversed without imposing greater

burthens upon the students than at present, at the same time that forty additional lectures would be communicated. Your Committee therefore recommend the adoption of the following resolution.

Resolved, That the report of the Committee on the establishment of a Professorship of Pharmacy be referred to the Board of Trustees, with instructions to take the necessary measures for establishing the said Professorship.

DANIEL B. SMITH,
WILLIAM PROCTER, JR.,
A. J. L. DUHAMEL,
EDWARD PARRISH,
SAMUEL F. TROTH,
CHARLES ELLIS,
JOSEPH C. TURNPENNY,
JOHN H. ECKY,
WM. J. JENKS.

Philadelphia, 5th mo. 4th, 1846.

The report and accompanying resolution were unanimously adopted.

From the Minutes.

DILLWYN PARRISH, *Secretary*.

At a special meeting of the Board of Trustees of the Philadelphia College of Pharmacy, held Sixth month 1st, 1846,—On motion of Augustine J. L. Duhamel, it was resolved to proceed to the election of an occupant for the new professorship in the School of Pharmacy; whereupon, WILLIAM PROCTER, JR., was unanimously elected Professor of Pharmacy.

EDWARD PARRISH, *Secretary*.

COMMENCEMENT.

At a public Commencement of the Philadelphia College of Pharmacy, held on Wednesday evening the 15th of April, 1846, the degree of "*Graduate in Pharmacy*" was conferred upon the following gentlemen, pupils in the Institution :—

William B. Webb,	Thesis on	Rubus villosus.
William N. Needles,	"	Cornus Florida.
Caleb H. Keeney,	"	Rubus villosus.
Joseph Allen McMaken,	"	Marrubium vulgare.
Thomas Leidy,	"	Scutellaria lateriflora and hyssopifolia.
Robert M. Patterson,	"	Morphia.
Peter T. Wright,	"	Leontodon taraxicum.
George W. Patrick,	"	American Bromine.
John Dickson,	"	Camphora.
Charles F. Stoever,	"	Hedera helix.
Thomas James Scott,	"	Syrupus Ipecacuanhæ.
Jacob L. Baker,	"	Sabbatia angularis.
Benjamin R. Smith,	"	Diospyros Virginiana.
Robert England,	"	Gillenia trifoliata.
Hiram C. Lee,	"	Impure Carbonate of Zinc.
John A. Whartenby,	"	Matico.

The valedictory address was delivered by Prof. Carson.

Extracted from the minutes.

EDWARD PARRISH, Secretary.

MISCELLANY.

On some new substances from Tobacco.—By M. Barral.—The juice obtained by digesting tobacco-leaves in water is strongly acid. This acidity has been attributed by Vauquelin to the presence of malic acid; but on crystallizing the syrup, either under the air-pump or at a gentle heat and exposure to the air, I obtained an acid in micaceous lamellæ, soluble in water, yielding an insoluble salt of lead and crystalline combinations with ammonia, nicotine, potash, &c.

This acid, which I shall call *nicotic*, is represented by the formula $C^3\,H\,O^3 + H\,O$, and its lead and silver salts by $C^3\,H\,O^3 + PbO$ and $C^3\,H\,O^3\,AgO$. The great tendency which this acid has to form double salts, and all the reactions which it yields, lead to the presumption that the preceding formulæ should be doubled. It is decomposed by heat and sulphuric acid into acetic and carbonic acids.

This acid appears to stand in the same relation to metacetonic acid as oxalic acid does to acetic acid.

The essence of tobacco or *nicotianine* contains nitrogen; on distillation with potash it yields nicotine. Its composition is—

Carbon	71.51
Hydrogen	8.23
Nitrogen	7.12
Oxygen	13.12

Chem. Gaz. from Comptes Rendus.

Employment of Rochelle Salt in Dyeing.—By J. A. Benckiser.—The potassio-tartrate of soda may be substituted in all cases in the dyeing of wool, both for the crude as well as for the purified tartar; it has even several advantages over it. It is pure, always of the same composition, and readily soluble in water, while the bitartrate of potash is so frequently mixed with foreign ingredients that often only 50, rarely more than 70 per cent. of pure bitartrate can be obtained from it. The impurity in the colour of the tartar may very readily injure that of the cloths; the fibrous parts of the tartar adhere to the wool, and the fragments of sulphur which frequently occur in it make spots; moreover, a portion frequently remains undissolved in the water, and is lost. The

potassio-tartrate of soda is capable of decomposing a larger quantity of alum, sulphate of iron, tin, salt, &c., the whole of the tartaric acid combining with the alumina or the metal by double decomposition. Instead of 100 lbs. *Cryst. tartari* (price 70*s.*,) there is required only 66 lbs. of Rochelle salt (price 52*s.*)—*Ib. Archiv. der Pharm.*

Bologna Catechu. Partiglie di terra catecu Aromatica of the Italians.—By M. Dorvault.—The following formula for this preparation is of Italian origin:—

Extract of liquorice by infusion -	} *aa* 10 grammes.
Water - - - - - -	

Place it in a sand-bath, and add,

Bengal catechu, in powder 30 grammes.

Gum in powder, - - 15 grammes.

Evaporate it to the consistence of an extract, and then incorporate the following powders, which must be exceedingly fine:—

Mastic - - - - -	} *aa* 2 grammes.
Cascarilla - - - -	
Charcoal - - - -	
Florence iris - - - -	

Let the mass become of a proper consistence, remove it from the fire, and add,

English essence of peppermint. - - - -	} 2 grammes.
Tincture of amber - -	} *aa* 5 drops.
Tincture of musk - -	

Pour it on to a slab of marble, previously greased, and roll it out by means of a rolling pin to the thickness of a half-franc piece. When the mass is cold, rub it with a piece of blotting-paper, to remove the oil completely from both surfaces; then slightly moisten both sides, and spread silver leaf over them; allow it to dry; cut the sheet into narrow strips, afterwards cut the strips into very small squares or lozenges (about the size of the seeds of fenugrec.)

The catechu that is brought from Italy is contained in small oval deal boxes, weighing about 20 grammes, and covered with a large seal of red sealing-wax.

We do not give this receipt as the true one—the latter appears to be the secret of one or two Bolognese pharmacopolists—but merely as a formula producing an article that will in every respect answer the purpose of the Italian preparation.

The Bologna catechu is a pleasantly-tasted preparation; it is as frequently taken as a sweet-meat, as a medicine, and we must attribute

to it the tonic and carminative properties of the substances of which it is composed.

Two or three pastilles, or grains, are sufficient to give the breath the most agreeable perfume and freshness.

The Bologna catechu corrects the bad breath caused by affections of the stomach, decayed teeth, &c.; and smokers frequently use it to conceal the smell of tobacco. In most parts of Italy the richer classes always carry it about with them, and take it as a pastime.—*Chemist, from Journal de Pharmacie.*

Chemical Examination of Sassafras Root—By Dr. Hugo Reinsch.—Dr. Reinsch analysed the *bark* of the root, which contains a much larger portion of the active constituents than the wood. His results are as follows:

Water	90
Heavy volatile oil, Light volatile oil, Camphoraceous matter	8
Tallowy matter	8
Balsamic resin, Wax	50
Sassafrid	92
Tannic Acid	58
Sassafrid, tannic acid and gum	68
Albumen	6
Gum, red colouring matter, and salts	30
Starch, Reddish brown colouring matter, tannic acid, and salts	54
Starch, tannic acid, &c., extracted by a solution of caustic potash	289
Insoluble woody fibre	247
	1000

The substance called *sassafrid* is a peculiar principle, which may be arranged with tannic acid. It is difficultly soluble in water, but soluble in ether and alcohol. It communicates a dark colour to alcohol.

Sassafras *wood* freed from the bark yielded similar results; but it contained scarcely half the quantity of the constituents which the bark yielded, and the volatile oil was even in still smaller quantity. This fact is especially worthy of notice, because we, in general, obtain from Druggists the wood already cut, the bark being previously removed and sold separately.—*Ibid, from Buchner's Repertorium.*

The means of ascertaining the efficacy of Digitalis. By M. Falken.—According to M. Falken. the following plan is a means of ascertaining, in an infallible manner, whether or not digitalis possesses its virtues.

50 centigrammes of the powder of the leaves of digitalis are to be infused in boiling water, and after an hour to be strained off. When cold 20 to 30 drops of a solution of ferrocyanide of potash are added, prepared with 75 centigrammes of this salt, to 15 grammes of distilled water.

If the digitalis is active, the infusion becomes rather clouded, but if the cloud does not appear before ten or fifteen minutes, we may consider the digitalis as not possessing a sufficient degree of activity.

According to M. Falken, the digitalis grown in Switzerland has proved the most active.—*Ibid.*

Dr. Goudret's Ammoniacal Blistering Ointment.—The following improved formula for this application is recommended by the author in in preference to that which has hitherto been in use:

Take of Lard - - - 32 parts
Oil of Almonds - - 2 "

Melt the lard with the oil by the application of a gentle heat; pour them in the melted state into a wide-mouth bottle, and add

Solution of Ammonia - - 17 parts

Mix, by continual agitation, until it becomes cold. It is necessary to avoid the application of much heat in the preparation of this ointment. When well prepared it will produce vesication in about ten minutes and will retain its properties unimpared for about a month, if kept in a well stopped bottle.—*Ibid, from Journal de Pharmacie.*

ELLIS'S MEDICAL FORMULARY.

Correction.—*The Publishers of this Work respectfully request those persons who have the seventh edition, to correct a tyrographical error for the* "MEDICATED HYDROCYANATE OF POTASSA," [*cyanide of potassium,*] *at page* 83; *wherein the symbol for an ounce is used in place of that for a drachm. The following is the correct prescription, and corresponds with the proportions directed in all the previous editions of the Work:*

℞. Potassii hydrocyanici medicati, ℥j.
Aquæ destillatæ, Oj.
Sacchari purificati, ℥iss.
Fiat solutio.—Dose, a table-spoonful, night and morning.